

FLIGHT

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AND AIRSHIPS

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CONTENTS

	PAGE
Editorial Comment:	
Lessons of the Air Exercises—and Others	743
The King's Cup	744
The King's Cup Air Race	745
Circuit of Italy	758
A Submarine Aircraft Carrier	759
Air Exercises	764
Private Flying and Club News	770
Airport News	773
Airisms from the Four Winds	774
Royal Air Force	775
Aircraft Companies' Stocks and Shares	776

EDITORIAL COMMENT



AIR enthusiasts must have had their fill of flying interests in the past week. The Air Exercises and the King's Cup Race in one week made almost an *embarras de richesse*. From the weather point of view it was an extraordinary week. Monday was not too good; the middle of the week was as good an imitation of real summer as the "Year of Grace" 1931 has yet contrived to produce; the Saturday was one of the vilest days on which it has ever been our hapless lot to have to kick our editorial heels on an aerodrome.

Let us consider the Air Exercises first, as they came first in point of time. The weather was first so bad that it almost defeated the enemy, and rendered his raids abortive. At the end it became so fine that the bombers got no protection at all from clouds. The weather always affects the validity of the lessons to be drawn from sham fighting in the air. A real enemy will usually wait for weather which suits his tactics. Air Vice-Marshal Newall was obliged to do the best with the weather as he found it. Except on Tuesday, the weather was favourable to the defence.

Already we have heard the usual pessimistic remarks that our defence has done badly, and that the bombers have had the best of it. Some of the sensational papers have drawn lurid pictures of the results of the imaginary bombing; but on the whole we notice a more temperate and reasonable attitude in the daily Press this year than on some previous occasions. Undoubtedly this has partly been due to the improvement this year in the matter and style of the official communiqués issued by the Air Ministry. They told more than in some previous years; they emphasised salient points; they did not shrink from pointing out mistakes made by units on several occasions, and they even admitted some laches in the organisation. Consequently the communiqués have attracted the attention of air correspondents who might otherwise have merely let themselves go on "lurid stuff," and the comments on the whole have been reasonably reasonable.

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

1931

- July 25-Aug. 9. Rhon Gliding Competitions, Germany.
- July 27-28. Cricket. R.A.F. v. Free Foresters at Camberley.
- August 1. Cardiff Flying Club Opening, Wenvoe Aerodrome, Cardiff.
- August 1. Opening at Ipswich of Eastern Counties Ae.C.
- August 1. Night Flying Display at Ratcliffe.
- Aug. 1-2-3. Southdown Skysailing Club's Annual Flying Meeting.
- Aug. 3-4. Cricket. R.A.F. v. R.N. at Halton.
- August 12. Flying Meeting at Cowes Aerodrome.
- Aug. 15. Scarborough Ae.C. Air Pageant.
- Aug. 15. Manchester-Liverpool Inter-City Race.
- August 22. Northants. Flying Party at Horsey Toll.
- Aug. 22. Newcastle-on-Tyne Meeting.
- August 29. Flying Meeting at Yarmouth.
- Aug. 29-Sept. 5. Boulogne Air Week.
- Aug. 29-Sept. 7. U.S. National Air Races, Cleveland, Ohio.
- Sept. 5. Norfolk and Norwich Ae.C. Display at Yarmouth.
- Sept. 5. Haldon Flying Meeting.
- Sept. 12. Schneider Trophy Contest.
- Sept. 23-Oct. 11. French Two-Seater Light 'Plane Competition.
- Sept. 26. Garden Party, Bristol and Wessex Ae.C.

There is always much that is unreal in manoeuvres. No one ever gets his nerves shaken by anti-aircraft fire. Umpires judge machines to have been shot down according to rules which might not really work out in the same way in actual fighting. Bombers which have been judged by the umpires to have been shot down, fly serenely on their way and drop their bombs, as if nothing at all had interfered with them. Each day the war came to a pause between 9 a.m. and 6 p.m., and tired men could have a good rest. All this is very unreal.

A few points, however, stand out as worthy of consideration. In the first place the scheme for the defence of London has more than one string to its bow. In these exercises it used only one string, namely, attacks by the fighter squadrons. In these circumstances the defence, helped on the whole by the weather, may be judged to have done very well. Twenty-four raids were made in daylight by six day-bomber squadrons in the three days, and of these only four flew in and out without being engaged by the fighters. That speaks very well for the working of the communications system and for the handling of the fighters by Air-Commodore Bowhill, C.M.G., D.S.O., who commands the Fighting Area.

A great deal depended upon the types of aircraft engaged on each occasion. The "Hart" squadrons of bombers could laugh at the attempt to tackle them made by the five remaining "Siskin" squadrons. It was known beforehand that that would be so, and so no new lesson was taught. Nos. 19, 56, 29, 1 and 25 (Fighter) Squadrons will soon, we hope, be re-equipped with either "Bulldogs," "Furies," or fighter "Harts." The "Bulldog" squadrons did very well, and were well placed to catch the raiders. The one experimental flight of "Hart" two-seater fighters seems to have given a good account of itself, but the communiqués were not very communicative on that point, and one could hardly have expected them to be so. An interesting experiment on a small scale was in progress, and the limited lessons to be learnt from it will doubtless be carefully considered by the Air Staff. We may see the result in the next re-equipment programme.

It seems fairly clear, as our correspondent at the exercises points out elsewhere in this issue, that it is mistaken tactics to station a squadron of interceptor fighters on a coast aerodrome. If the interceptors are to catch raiders as they come in, which would seem to be the proper function of an interceptor, they should be stationed farther inland, where there is a reasonable chance of getting them into the air before the raiders have passed out of their sector. The coast aerodromes may be useful for catching raiders on their return journey to the coast, and in that case they should be manned, not by interceptors, but by standard fighters. That remark is made on the assumption that in the future a distinction will be allowed to continue between standard fighters and interceptor fighters. We admit the possibility that the endurance of the interceptor may be considered sufficient for all purposes, and that this type may be made standard for the Fighting Area.

Another lesson of these exercises—not a novel theory but one which has been emphasised anew—is the fighting power of the bomber squadrons. Whenever a fighter squadron attacked a bomber formation, some casualties were always given against the fighters. The casualty returns in sham fighting are necessarily always fictitious. The only point to

take hold of is that the umpires always considered that the fighters would have suffered some loss. In daylight operations this gives us food for thought. We admit that we are rather sceptical about the chances of a night-bomber when caught in searchlights and attacked by fighters which come at it out of the darkness. We console ourselves by reflecting that in these exercises the bombers as well as the fighters were British, and it is good to know that our day-bombers can hold their own in a fight. If they can do that when attacked by British fighters, they can face any foreign machines with a great deal of confidence. The lesson is that our squadrons of all descriptions must always be equipped with the very best. It is because our design is ever advancing, and advancing very quickly, that it runs ahead of our re-equipment programme, and that each year's air exercises always find us using some types which are very far behind our best. But our Air Force is small, and the excuse for its smallness is that it can be kept constantly in the forefront, so far as types of machines are concerned. When, despite its smallness, we find it flying some antiquated types, we feel that things are not quite as they ought to be. This year, however, good progress has been made in serving out new types, and we hope that there will be no slackening off in this respect.

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On the whole, and in spite of the very bad weather conditions, this year's race for the Cup presented by His Majesty the King must be voted a success. That so many competitors should fall by the wayside was inevitable under such weather conditions. Of mechanical failures there were remarkably few, taking into consideration the gruelling test of engines which 1,000 miles at full power imposed. And, fortunately, not a single serious mishap marred the race. In figures, out of 41 entries there were 40 starters, and 21 finished the race. Last year there were 101 entries, of which 88 started and 60 finished.

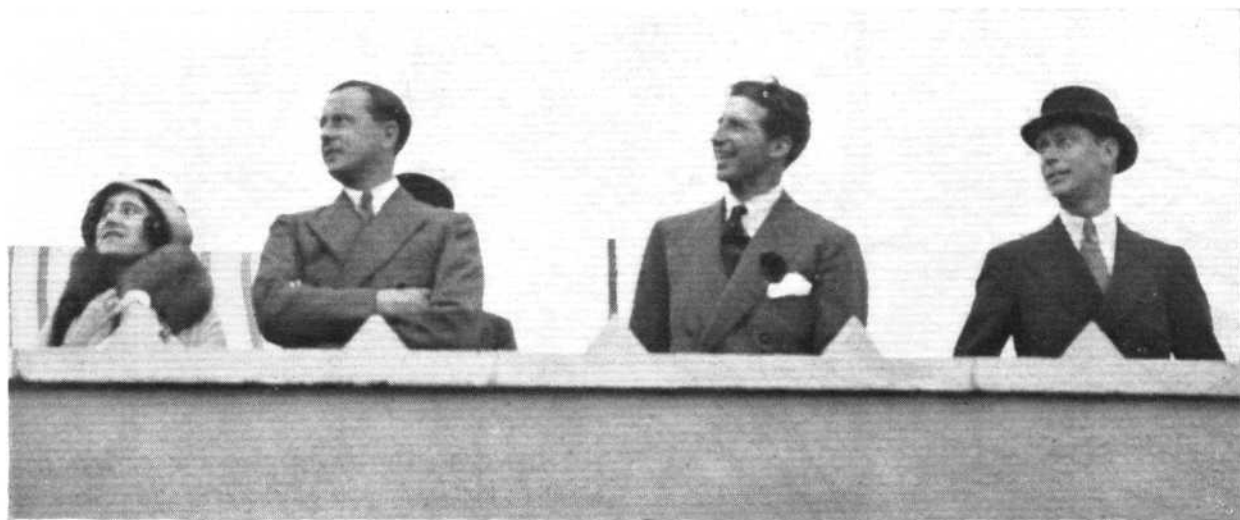
The King's Cup

There was considerable speculation before the race as to how the real "amateurs," as distinct from Service pilots, who were permitted to enter but were certainly not amateurs in the art of piloting, would fare in the race. Weather conditions were such as to impose the very severest tests of a pilot's abilities, not only as a pilot but as a navigator. In the main, the real "amateurs" did remarkably well. Among them should be included the representatives of the Royal Navy, for they *were* amateurs in the matter of piloting, while the kind of navigation demanded in the King's Cup Race was as different as possible from the navigation a naval officer has to do.

The lady pilots fared badly, as was to be expected. But a single one got through the whole race, and the very greatest praise is due to Miss Crossley for her pluck in completing the course under such very bad weather conditions.

As distinct from last year's race, the organisation throughout was good, and we heard no single complaint from a competitor on this score. From the point of view of the public, the numbering in accordance with the handicap, suggested by FLIGHT last year and again last week, and carried out by the Royal Aero Club at the last minute, proved an undoubted success. It was possible for all to follow the race, and of last-minute changes in handicaps there were very few indeed.

THE KING'S CUP RACE 1931



ROYAL VISITORS: The Duke and Duchess of York visited Heston and saw some of the King's Cup machines arrive on the first round. They are seen above with Mr. F. A. I. Muniz (left centre) and Mr. N. St. V. Norman (right centre) of Airwork, Ltd.

AT HESTON (THE START)

FOR once the official gust guessers were correct with their forecast, and Heston was already rain-soaked long before the first machine was due to leave at 6 a.m., and, with the exception of a few fair intervals, it continued to rain until the last machine had got away. This made conditions particularly unpleasant, as the take-off had to be made from west to east with the first turn towards the large gasometer which is so prominent beyond the northern end of the Aerodrome. At times this landmark was completely out of sight, and many of the competitors must have had an anxious few moments until they were clear of it. The general ground organisation was good, and the marshalling of the machines at the start of the race, at any rate, ran very smoothly.

There were very few last minute changes in the handicapping. No. 7, the Moth (Gipsy I), flown by Flight-Lieutenant W. L. Dawson, was brought back and placed between Nos. 14 and 15, while No. 25, Squadron-Leader F. E. Guest's (Gipsy I), was brought back and started some 5 min. after No. 26. There were only two non-starters, No. 13 (which was left out of the programme owing to the superstition of the entrant!) and No. 16, Flying-Officer V. S. Bowling, on the Civilian Coupé. Actually, therefore, 40 machines got away from Heston. There were not many incidents of interest during the actual start, which went like clockwork from beginning to end. The first to cause a mild sensation was Squadron-Leader Carnegie, who took his Spartan on a very wide sweep to the south, losing quite a considerable time in doing so. One of the finest take-offs was undoubtedly Flight-Lieutenant Gibbons, also in a Spartan, who ultimately came in second at the end of the race. He did not lose a second. He

held his machine down to gather maximum speed, and made the most beautiful turn of anyone, finishing up on his course. No. 22, Mr. A. C. P. Johnstone, in an Avian, who was on the outside of the turn with Mr. J. "Wellworth," very nearly seriously impeded the latter by turning too sharply into him, causing him to zoom up in a tight climbing turn to get out of the way. We had great hopes that Miss Diana Guest would be successful in the race, as her engine, a Gipsy II, seemed absolutely perfect, and when running up on the starting line sounded more like a sewing machine than an aircraft engine. She was, however, forced down by bad weather later on, much to everyone's regret.

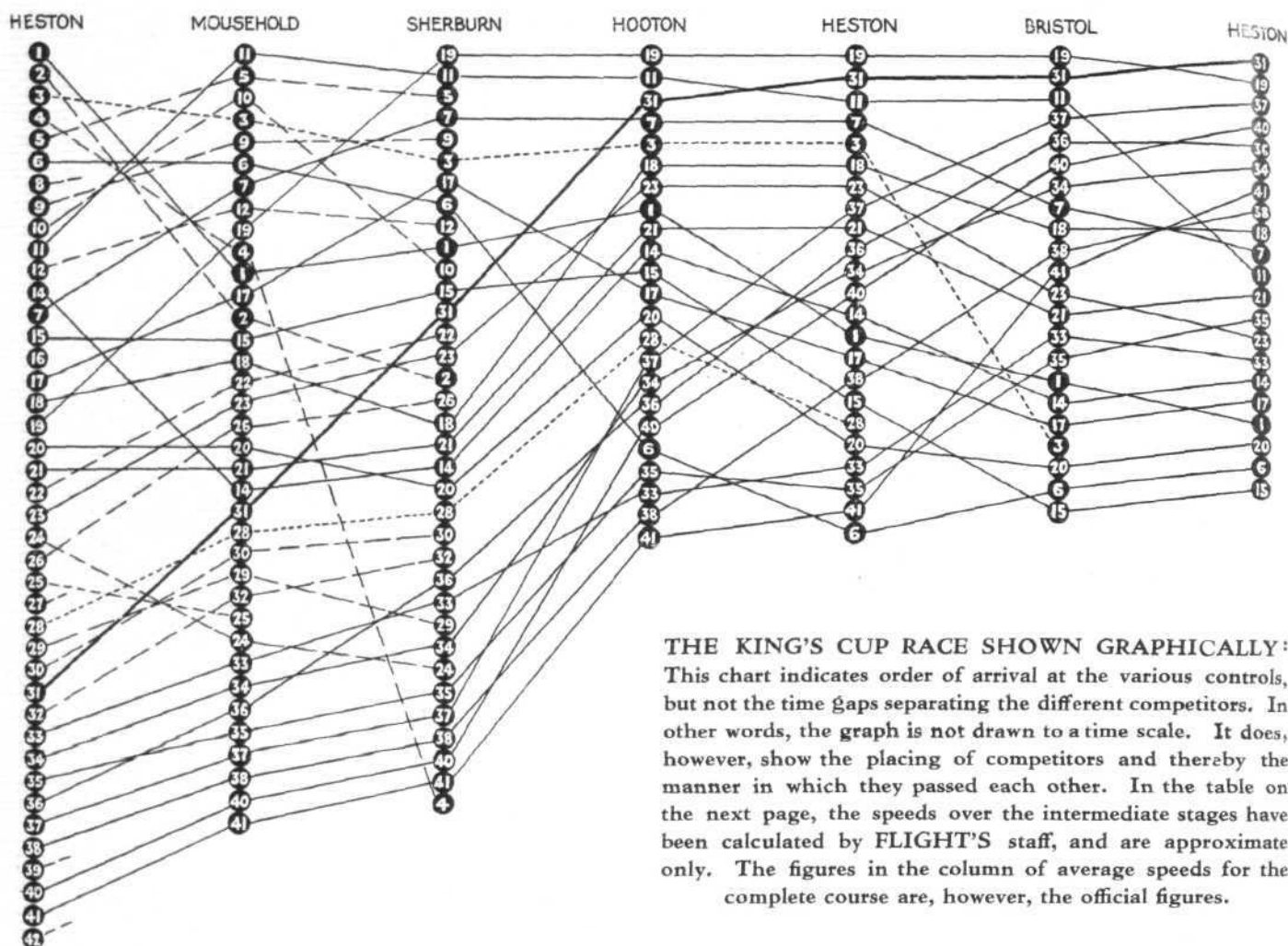
One of the first who met with misfortune was Mr. H. R. Law, in his Westland Widgeon (Hermes II), whom we were told had the misfortune to break his propeller

in the air, and had to land at Somerby, near Oakham, the capital of that miniature little county, Rutland. Mr. Law's machine was clean, and with the Hermes II engine appeared to have exceptionally good acceleration at the take-off; in fact he was one of the hot favourites for the race, and there was therefore much consternation when it was found that he had dropped out. Nos. 30 and 31, two Bluebirds flown by Flight-Lieut. D. H. Atcherley and Flying-Officer E. C. T. Edwards, the latter being the ultimate winner of the race, made the first somewhat hectic take-off, when they appeared very nearly to foul each other, with the result that one saw a Bluebird brought up in a sharp left-handed climb turn, finishing off with a flat skid at the top, a manoeuvre which brought the hearts of many present to their mouths.

Mr. J. C. Webster, the visitor from Canada flying the Curtiss-Reid Rambler (Gipsy



THE REWARD: Sir Philip Sassoon presents the King's Cup to F.O. E. C. T. Edwards. (FLIGHT Photo.)



THE KING'S CUP RACE SHOWN GRAPHICALLY:
This chart indicates order of arrival at the various controls, but not the time gaps separating the different competitors. In other words, the graph is not drawn to a time scale. It does, however, show the placing of competitors and thereby the manner in which they passed each other. In the table on the next page, the speeds over the intermediate stages have been calculated by FLIGHT'S staff, and are approximate only. The figures in the column of average speeds for the complete course are, however, the official figures.

III), made an exceptionally neat straightforward take-off without wasting a second. His machine seemed to have very good acceleration indeed, but was, we are afraid, a little hardly dealt with by the handicappers. Mr. Webster was really most extraordinarily sporting to bring his machine over and enter for a race in England, for the type of country to be flown over was totally new to him, and the odds were naturally on the weather being very bad. He, however, thoroughly justified his entry, and we should like to congratulate him on his very fine effort, hoping at the same time that what he saw on Saturday will give him a good idea of the capabilities of our real private owners. While on the subject of amateurs, it is worth while noting that of the finishers, there were many who have had very little experience of flying indeed, and who can now be justifiably proud of themselves in having finished a race under such conditions; conditions, indeed, which gained the better of many of the Air Force pilots. Particular mention, we feel, should be made of Miss Crossley, who only learnt to fly last year, and who, although she had a navigator in the front cockpit, flew the machine herself from beginning to end. The Navy was also represented on this occasion by three genuine private owners, all of whom finished, and thereby gained a 100 per cent. success for the senior service. Another who put up a very stout show was Mr. G. N. Wilson, the Assistant-General Manager of the Shell Co., who has had comparatively little experience, but who worried through and finished the course.

No. 36, Mr. Wallace Barr's Avian, with the new 7 cyl. Genet engine, had been cleaned up and fitted with Townend ring type of engine cowling. This machine was also one of the much fancied "dark horses" at the start, and quite a considerable amount of money was put on him at the Tote. Unfortunately a certain amount of the extra streamlining on the machine had not previously been declared, and had to be removed before the race, thereby, probably, reducing his speed.

Mr. Morris Jackaman provided an unwanted thrill when he took off, as he appeared to think he could turn quicker on the ground than in the air. He proceeded to turn cross wind across the Aerodrome on one wheel and a wing

tip, finally taking off in what looked like a very dangerous condition. He managed to get away with it, however, much to the relief of everyone, though the amount he saved did not, we are afraid, avail him very much later on. With the Comper Swift flying it was the first time that the Pobjoy engine has been seen in a race, and its performance was followed with great interest; that it finished the course at all, and in such a creditable manner, is undoubtedly a feather in the cap of its makers and also of the Pobjoy Engine Co. It was really a hot favourite, and headed the betting list for nearly the whole race.

The last man to get away was Flight-Lieutenant Wincott on the Arrow Active (Hermes IIB), and he did not leave until some 35 min. after Mr. Jackaman, during which time the majority of those present were taking advantage of the excellent breakfast provided by Airwork, Ltd. This breakfast was really one of the high lights of the day, and was appreciated by everyone, particularly those who were down at the Aerodrome some time before the start. However, both the breakfast and "scratch" man were quickly despatched, but some disappointment was caused by the latter, for misfortune overtook him early in the race—before he got to Norwich—in the form of a forced landing in a small field at Caddington, from which he could not take off again. We sympathise with Mr. Thornton on this piece of bad luck, for all were expecting great things from the "Active." It must be remembered, however, that it must be extremely difficult to fly in such terrible weather on a small high-speed aircraft like the "Active."

AT MOUSEHOLD

On the morning of the King's Cup Race the wind at Mousehold (Norwich) was blowing from the south-east, and there was a heavy sky. There was, however, no rain, although conditions looked ominous for the competitors. Naturally enough, interest at Mousehold centred very largely on the performance of Mr. Fred Gough, manager of the Norfolk and Norwich Aero Club, who was flying his Gipsy I Moth in the race.

The organisation at the Mousehold control was good, and the arrangements worked well, everybody being

	Letters	Entrant	Pilot	Aircraft	Course	Time h. m. s.	Time h. m. s.	Speed m.p.h.	Speed m.p.h.	Time h. m. s.	Time h. m. s.	Time h. m. s.	Time h. m. s.	Time h. m. s.	Time h. m. s.	Time h. m. s.	Time h. m. s.
1	EBRO	Sqd.-Ldr. Hon. R. A. Cochran	J. G. Ormston	Widgeon III	Cirrus III	2 33 13	6 00 00	91.4	99.5	105.2	95.3	90.6	85.7	19 52 25	93.20		18
2	AATE	Alderman C. V. Walker	Flt.-Lt. J. Bradbury	Bluebird IV	Gipsy I	2 33 13	6 00 00	88.0	96.9	Retired at Sherburn	(Leeds).						
3	AAGY	F/O. J. F. X. McKenna	F/O. J. F. X. McKenna	Spartan	Cirrus III	2 33 13	6 00 00	96.7	99.5	98.9	97.0	74.7	Retired at Whitchurch	h (Bristol).			
4	AAGO	Flt.-Lt. G. H. Stainforth	Sqd.-Ldr. D. V. Carnegie	Spartan	Cirrus III	2 33 13	6 00 00	92.7	50.4	Retired at Grantham	on account of weather.						
5	AAUU	Harald Peake	Sqd.-Ldr. J. W. Woodhouse	Bluebird IV	Gipsy I	2 33 13	6 00 00	100.7	105.0	Retired at Sherburn	on account of weather.						
6	AAKC	Miss F. J. Crossley	Miss F. J. Crossley	D.H. Moth	Gipsy I	2 33 13	6 00 00	95.0	99.5	74.8 ¹	104.4	78.3	113.6	20 20 00	89.25	20	
8*	AAEF	T. W. Shipside	T. W. Shipside	D.H. Moth	Gipsy I	2 33 13	6 00 00	97.8	Retired at Radlett	due to bad weather.							
9*	AARU	F. S. Symondson	F. S. Symondson	D.H. Moth	Gipsy I	2 33 13	6 00 00	98.7	99.5	Retired at Sheffield.							
10	AAIR	F/O. J. W. Gillan	F/O. J. W. Gillan	Bluebird IV	Gipsy I	2 33 13	6 00 00	100.7	90.0	Broke a flying wire and retired at Sherburn.							
11	AAJP	John Grierson	John Grierson	D.H. Moth	Gipsy I	2 33 13	6 00 00	103.3	105.0	101.7	100.0	96.8	78.6	19 24 20	97.60	11	
12*	AAHK	Arthur Franklyn	Arthur Franklyn	Avian IV	Gipsy I	2 33 13	6 00 00	96.7	94.5	Retired on account of weather.							
14	AAML	Lieut. C. R. V. Pugh, R.N.	Lieut. C. R. V. Pugh, R.N.	Spartan	Hermes II	2 27 22	6 05 51	80.8	105.0	102.2	105.1	87.1	117.8	19 36 14	96.60	16	
7*	AAFK	Geoffrey Linnell	Flt.-Lt. W. L. Dawson	D.H. Moth	Gipsy I	2 24 29	6 08 44	100.7	105.0	101.7	101.2	78.3	117.8	19 17 55	100.00	10	
15	AARI	L. O. Russell	L. O. Russell	D.H. Moth	Gipsy I	2 24 29	6 08 44	93.5	99.5	101.1	95.3	65.8	113.6	20 23 00	90.00	21	
16	ABFJ	F/O. V. S. Bowling	F/O V. S. Bowling	Civilian Coupé	Genet Major I	2 24 29	6 08 44	Non-Start er.									
17	ABAG	T. C. Fawcett	T. C. Fawcett	D.H. Moth	Gipsy I	2 21 38	6 11 35	100.7	105.0	82.3	105.1	90.1	115.0	19 38 47	97.10	17	
18	AADE	C. S. Napier	C. S. Napier	Widgeon III	Gipsy I	2 18 48	6 14 25	95.8	96.9	106.4	95.3	92.2 ²	125.7	19 16 35	101.30	9	
19	AAHA	Flt.-Lt. F. G. Gibbons	Flt.-Lt. F. G. Gibbons	Spartan	Hermes II	2 16 00	6 17 13	109.0	114.5	111.0	106.4	98.0	125.7	18 37 15	109.10	2	
20	AALE	G. N. Wilson	G. N. Wilson	D.H. Moth	Gipsy I	2 13 14	6 19 59	93.5	96.9	96.8	100.0	86.2	94.3	20 01 58	94.80	19	
21	EBRQ	"J. Wellworth "	"J. Wellworth "	Widgeon III	Genet II	2 10 29	6 22 44	93.5	108.0	99.5	106.4	91.2	122.4	19 25 00	101.24	12	
22	AAHE	A. C. P. Johnstone	A. C. P. Johnstone	Avian IV	Cirrus III	2 10 29	6 22 44	100.7	113.1	Retired at Sheffield.							
23*	EBWU	Lt. Caspar John, R.N.	Lt. Caspar John, R.N.	Avian IV	Cirrus III	2 10 29	6 23 14	100.7	113.1	101.7	95.3	90.6	124.0	19 26 30	101.00	14	
24*	ABCG	Fred Gough	Fred Gough	D.H. Moth	Gipsy I	2 05 04	6 28 09	78.6 ³	106.1	Retired.							
26	ABHM	Sqd.-Ldr. Hon. F. E. Guest	Miss Diana Guest and F/O. Rupert Nash	D.H. Moth	Gipsy II	2 05 04	6 28 09	103.4	105.0	Retired.							
25	AALK	Sqd.-Ldr. Hon. F. E. Guest	Hon. F. E. Guest and P/O. A. D. Selway	D.H. Moth	Gipsy II	1 59 46	6 33 27	81.8 ⁴	Retired at Norwich.								
27	EBRN	H. R. Law	H. R. Law	Widgeon III	Hermes II	1 59 46	6 33 27	Landed at Somerby,	near Oakham, due to propeller breaking.								
28	ABBN	Lord Stonehaven	M. L. Bramson	Martlet	Genet II	1 54 33	6 38 40	103.4	105.0	96.8	101.8	Retired at Shoreham.					
29	ABIF	Miss Jean Forbes-Robertson	F/O. H. H. Leech	Martlet	Genet II	1 44 25	6 48 48	103.4	94.5	Forced landing, near Grantham.							
30	AAOC	A. V.-M., A. M. Longmore	Flt.-Lt. D. F. Atcherley	Bluebird IV	Hermes II	1 39 29	6 53 44	109.0	113.1	Retired at Norwich	with split fuel tank.						
31	AACC	Robert McAlpine	F/O. E. C. T. Edwards	Bluebird IV	Hermes II	1 39 29	6 53 44	119.0	120.4	118.3	117.8	106.6	134.8	18 34 00	117.80	1	
32*	ABED	Miss Winifred S. Brown	Miss Winifred S. Brown	Avian Sports	Hermes II	1 16 08	7 17 05	119.0	120.4	Landed at Hickleton and retired due to burst tyre.							
33	AAHP	Sqd.-Ldr. James McKelvie	Lord Douglas-Hamilton	D.H. Moth	Gipsy I	1 11 42	7 21 31	115.5	118.2	90.5	117.8	103.0	124.0	19 27 19	112.10	15	
34	AAZF	Capt. Gerard Fane	Sqd.-Ldr. J. M. Robb	Comper Swift	Pobjoy R.1	1 03 04	7 30 09	119.0	119.5	113.0	124.0	108.1	138.7	19 08 21	118.30	6	
35*	CF-ABZ	J. C. Webster	J. C. Webster	Rambler III	Gipsy III	1 03 04	7 30 09	115.5	118.2	108.3	117.9	102.4	131.0	19 26 26	114.20	13	
36	ABME	A. J. A. Wallace Barr	Flt.-Lt. E. A. Healy	Avian IV M	Genet Major (7-cyl.)	0 54 43	7 38 30	129.5	128.5	104.6	130.0	114.3	145.0	18 59 35	122.50	5	
37	ABEH	Miss Peggy Salaman	Lt. Geoffrey Rodd, R.N.	Puss Moth	Gipsy III	0 40 46	7 52 27	131.0	130.3	124.8	132.0	116.2	145.0	18 54 40	127.50	3	
38	ABLS	E. L. Gandar-Dower	A. C. S. Irwin	Puss Moth	Gipsy III	0 40 46	7 52 27	122.7	127.7	113.8	127.0	112.0	138.7	19 14 35	122.30	8	
39*	AAYA	The Hon Lady Bailey	The Hon. Lady Bailey	Puss Moth	Gipsy III	0 40 46	7 52 27	Retired at Stag Lane.									
40	ABIY	L. M. J. Balfour	L. M. J. Balfour	Puss Moth	Gipsy III	0 36 55	7 56 18	126.7	127.7	131.2	126.0	118.8	145.0	18 59 10	127.36	4	
41*	AAYE	A. C. M. Jackaman	A. C. M. Jackaman	Puss Moth	Gipsy III	0 35 01	7 58 12	126.7	126.0	115.2	129.0	116.1	140.8	19 14 02	123.90	7	
42	ABIX	C. R. Belling	Flt.-Lt. C. B. Wincott	Arrow Active	Hermes II B	Scratch	8 33 13	Landed near Caddington and retired.									



"TWENTY-ONE TO-DAY": Mr. A. G. Reynolds, Official Starter, celebrates his 21st Anniversary of flagging away competitors in Air races by sending off the first two machines in this year's King's Cup. Mr. Reynolds first dropped his flag at the 1909 Blackpool Meeting.

refuelled and sent off again dead on time. One competitor wired the Mousehold control as follows: "For love of Mike have you one pair dry socks and pair seven shoes wet feet have ready at control point." They were ready and waiting for him when he arrived.

Most of the competitors arrived on a good course, although it is believed that a few had a good look at the Broads before landing. Miss Crossley ran out of petrol on arrival at the aerodrome, and landed successfully far out. It is hoped that she will always manage to run out of petrol in such a suitable place. The Comper "Swift" attracted a lot of attention, but there was keen disappointment at the non-arrival of the Arrow "Active," as people had been looking forward to seeing this very fast machine.

AT SHERBURN-IN-ELMET.

Thirty-five machines of the field of forty reached Sherburn from Norwich via Tollerton and Brough, a stage of 189 miles. They came in low eastwards from Brough,

through rain which was heavier at Brough than at Sherburn, where visibility was about $2\frac{1}{2}$ miles, and an overcast sky was slowly lowering from 3,000 feet, with the wind light and variable. Time and weather kept the public at bay, but this enabled Captain H. V. Worrall and his enthusiastic band of volunteer assistants from the Yorkshire Aeroplane Club to concentrate unhindered upon their control duties, with highly efficient results. The only complaints from competitors were centred upon the wretched weather which they had now wrestled with for nearly 400 miles—if their inevitable détours are allowed for—and were to expect no mercy as they turned southwest for Birmingham after a respite of 40 min.

A "Spartan" Leads.

At 10 hr. 25 min. 20 sec. Flt.-Lt. F. G. Gibbons crossed the line on his Cirrus-Hermes II "Spartan" G-AAHA (19) to lead the field, followed only 13 sec. later by Mr. John



THE WINNER: F/O. Edwards, in the Blackburn "Bluebird" (Hermes) immediately after arriving first back at Heston on the second lap.



SCENES AT THE START: 1—Nos. 23, 22, 21, 28, 27 lined up for the start. 2—Mr. Bramson and F./O. Leech running up the engines of their Martlets. 3—Miss Brown's Avian "Jerry" is nearest the camera (this is of course her new machine and not the one she won on last year), with Lord Douglas Hamilton's Moth just behind. 4—The Comper Swift was naturally a centre of interest, being second only to Mr. Webster's Rambler. 5—The Puss Moths lined up, Mr. Jackaman's is the one nearest the camera and looks fast with the spats on its wheels. (FLIGHT Photos.)



IGNORING THE WEATHER: Mr. Staniland's exhibition on the Fairey "Fire fly" in the weather which Heston suffered on Saturday was one of the most imposing ever seen. He is here seen just starting a climbing roll. (FLIGHT Photo.)

It was 21 min. 40 sec. after Gibbons that he crossed the line, 16 min. 53 sec. ahead of Atcherley on another Cirrus-Hermes "Bluebird," with the same handicap allowance. The position of Lt. G. Rodd on the Puss-Moth (37), who finally gained third place, was thirty-one; 1 hr. 6 min. 45 sec. behind Gibbons. He had picked up two places after leaving Norwich.

The positions of Messrs. Balfour (40), Healy (36) and Robb (34) who followed up the winning machines at the end of the race in that order were thirty-three, twenty-six and twenty-seven, respectively, amongst the thirty-five machines which reached Sherburn.

Two machines invited comparison by their progress, the Comper "Swift" and the Curtiss-Reid "Rambler," for their handicap allowances were the same. The "Swift" was 2 min. 18 sec. ahead of the "Rambler."

Miss Winifred S. Brown brought her Hermes-Avian (32) in twenty-third, two places ahead of her Norwich position.

After the first three already named, the next competitors arrived in the following order:—

Grierson on the Gipsy I "Moth" G-AAJP (11), both machines dead on their 27-mile course from Brough. The third machine in was the Gipsy I "Bluebird" G-AAUU (5), flown by Mr. Harold Peake and Sqd.-Ldr. J. W. Woodhouse, arriving 1 min. 18 sec. after Grierson. Gibbons had assumed the lead after leaving sixth at Norwich, and had gained 17 min. 26 sec. since leaving Heston.

Grierson had dropped to second place and Peake from second to third. Flying-Officer E. C. T. Edwards (ultimately the winner of the race) brought his Hermes-"Bluebird" (31) in twelfth, having picked up from the twenty-first position at Norwich.

Place.	Machine	Engine.	Machine Number.	Pilot.
4th	Gipsy-Moth	..	7	Flt.-Lt. W. L. Dawson.
5th	Gipsy-Moth	..	9	Mr. F. S. Symondson.
6th	Cirrus-Spartan	..	3	F/O. J. F. X. McKenna.
7th	Gipsy-Moth	..	17	Mr. T. C. Fawcett.
8th	Gipsy-Bluebird	..	10	F/O. J. W. Gillan.
9th	Gipsy-Bluebird	..	6	Miss F. J. Crossley.
10th	Gipsy-Avian	..	12	Mr. A. Franklyn.
11th	Cirrus-Widgeon	..	1	Mr. J. G. Ormston.
12th	{ Gipsy-Moth .. Hermes-Bluebird	{ 15 31	{ Mr. L. O. Russell. F/O. E. C. T. Edwards.



"FORTY MINUTES": Some of the Competitors—Nos. 21, 20, 18 and 14—refuelling at Heston on the first lap. (FLIGHT Photo.)

Miss Diana Guest was fifteenth on Gipsy-Moth (26). Her paternal rival, Captain F. E. Guest, P.C., failed to reach Sherburn.

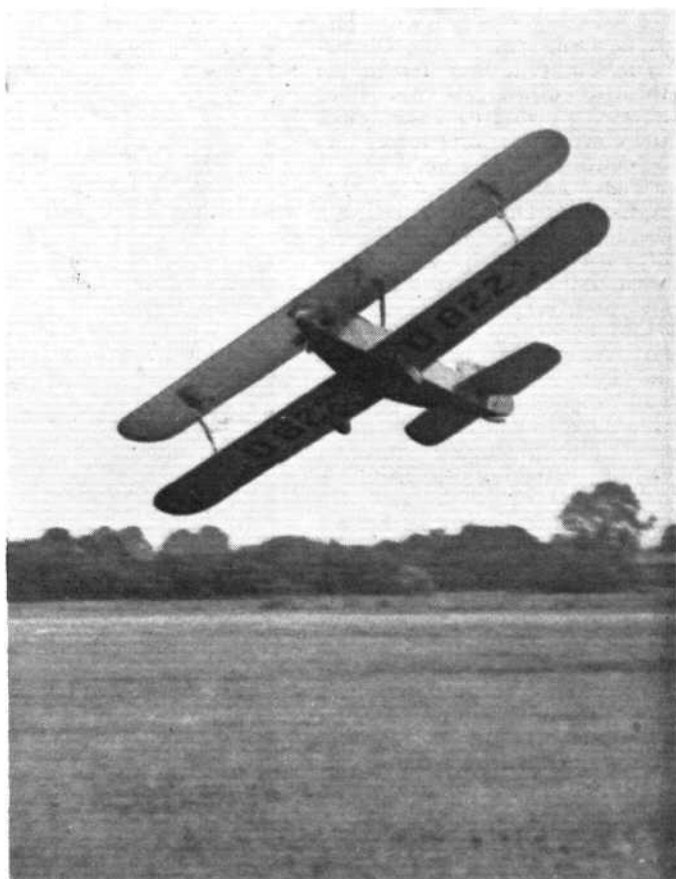
Competitors Retire

There were many machines eliminated from the race at this stage or on the next stage to Birmingham. Miss Brown came down at Heckleton, 20 miles south of Sherburn, and damaged her undercarriage, but she and her passenger were not injured. Miss Guest also came down after leaving here.

That a "Bluebird" gained the Cup was no doubt a gratifying compensation to the Sherburn and Brough air enthusiasts, for the failure of the "Arrow Active" had been a keen disappointment, and their interest in the event waned further when four out of the five "Bluebirds" retired here. Flight-Lieut. Atcherley's "Bluebird" developed a cracked seam in the gravity tank as he was taxiing to the starting point to take-off for Birmingham; terminating a promising performance. Similar trouble to the same machine forced it out of last year's race, if our memory is correct. A broken flying wire frustrated F/O. J. W. Gillan on "Bluebird" (10) after his arrival, and the third machine in, "Bluebird" (5), developed valve-seating trouble. The fourth "Bluebird" retirement was Flight-Lieut. J. Bradbury's (2). He had already lost some time before reaching Sherburn through a necessary detour, and he had been gone ten minutes on the stage to Birmingham when he met a very bad patch of dark cloud, which compelled him to return.

Two machines had a narrow escape from colliding on emerging blindly from low clouds after leaving Sherburn. They were the Curtiss Reid "Rambler," flown by Mr. J. C. Webster, and Mr. F. Gough's Gipsy-Moth (24), which found themselves flying wing-tip to wing-tip when they left the clouds. Gough had already lost considerable time through being diverted from the course at Leicester, and a survey of his chances decided him to return to Sherburn.

The Armstrong-Siddeley Genet "Martlet" (29), flown by F/O. H. H. Leech, finished at Sherburn. His engine was pulling well, but he was only making 102 m.p.h. at the most, which was about 7 m.p.h. below the figure he was handicapped upon, so there was hardly a good reason



OUR GERMAN VISITOR: Herr Udet is here seen "skating" his "Flamingo" sideways across the Aerodrome. (FLIGHT Photo.)



THE ST. SWITHIN HANDICAP: A corner of the Members' enclosure at Heston during a lull in the proceedings (but not rain). (FLIGHT Photo.)

for finishing the course. Mr. J. G. Ormston, on the Cirrus-Widgeon (1), was forced to throttle down *en route* to Sherburn owing to a section of the cowling working loose, but he continued the race.

For some time No. 4, Sqd.-Ldr. D. V. Carnegie's Cirrus-Spartan, was missing between Norwich and Sherburn, but it eventually arrived last and very late, at 12 hr. 34 min., nearly an hour after Mr. A. C. M. Jackaman on his Puss-Moth had come in, and appeared to be last to trouble this control. Carnegie had forced landed through engine trouble, suffering a delay of 1 hr. 35 min. He caused general surprise by his decision to carry on. Possibly the heavy rain that now drenched the aerodrome explained it. At 13 hr. 14 min. 33 sec. he took off, and, incidentally, his departure furnished the spectators with a clear example of how a collision between a machine rising and another landing can easily occur.

As Carnegie was gathering speed across the aerodrome, he was looking ahead from the port side, while on his right a Gipsy-Moth was landing very close and at an inward angle. Carnegie's passenger saw it and tried to draw his attention to it by stretching out an arm, but Carnegie went on and up unaware of the incident, the danger of which was perhaps more apparent than real, though it was none the less a useful lesson to the eye-witnesses.

With the departure of the last competitor there was nothing to detain even an air-minded enthusiast on the rain-soddened aerodrome. There were a few air visitors during the morning. The Duchess of Bedford braved the low clouds and rain to see the event, and the 16-seater Ford monoplane (three "Wasp" engines) came up from Heston at 145 m.p.h. to disgorge several passengers from its corrugated cabin, who included the well-known explorer, Col. T. P. Etherton. The pilot was Mr. H. C. Johnson, who informed one that for long stretches on the trip north he flew at 150 feet and still could not see the ground.

Finally it was good to learn how fast the Yorkshire Aeroplane Club is collecting private owners. They boast of ten now, five of whom own Puss-Moths. Two years ago no private owner flattered the Club as a satellite.



AT MOUSEHOLD: Lord Malcolm Douglas-Hamilton getting ready to leave.

AT HOOTON

During the early morning of July 25 the weather prospects at Hooton were far from promising for the King's Cup Air Race. The wind started by blowing from the west, as the morning went on it gradually changed towards the east, and then, during the actual race, it slowly veered back to west again. There was no actual rain until after all the competitors had left Hooton on their way to Heston, but visibility was very poor, especially looking towards the east, so that it looked as if the pilots coming from Sherburn, via Birmingham and Manchester, would have a rather uncomfortable time of it.

Hooton had been very thoroughly arranged and organised to take care of the expected crowds as well as of the competitors, but the uncertain weather outlook was not likely to encourage people to come out from Liverpool, etc., in such numbers as they would have done on a bright day. The organisation was in the hands of the Liverpool and District Aero Club, whose chairman is Col. A. Jerrett. Enclosures had been laid out, with refreshment tents, loud-speaker equipment, car parks,

etc., and R.A.C. scouts, boy scouts and others were in early attendance getting their instructions for the regulation of traffic.

Very properly and naturally, there was a great deal of interest in the fate of the machine which represented the Liverpool district in the race, the little Comper "Swift," with Pobjoy R.1 engine, both of which are, as FLIGHT readers will probably know, produced at Hooton. The radio service, as usual most efficiently operated by a Royal Air Force radio van, reported the start, on time, of the "Swift" from Heston, and great was the excitement until the arrival of No. 34 at Mousehold at 9.10 was reported. He had left Heston at 7.30, so that his average speed over the first stage had been 118 m.p.h., which was exactly the handicap figure. As it seemed quite likely that competitors had been having a beam wind, this was not too bad. The Comper and Pobjoy works, down to the smallest boy, breathed freely once more, for, of course, the work done in the shops that morning suffered severe



FIRST ARRIVAL AT HOOTON: Flt.-Lt. Gibbons has his Spartan (Hermes II) refuelled. He was away again before one-half of his competitors arrived from Sherburn.

interruptions. Shortly after 10.30 radio reports began to come in from the Sherburn control. The first arrival to be reported to Hooton, and broadcast there, was No. 11 (Grierson), whose time of arrival was given as 10 hr. 25 min. 33 sec. Then followed in quick succession reports of the rest of the competitors. By this time already a good many had dropped out, and weather reports from the controls indicated the reason.

Shortly after noon Mr. Dobson, of the Avro Company, came over in a black Avian Sports, and reported visibility not too bad between Woodford and Hooton, although there was a pretty bad patch a few miles east of Hooton. The Director of Civil Aviation, Col. Shelmerdine, arrived in a Desoutter monoplane, accompanied by Capt. A. G. Lamplugh, of the British Aviation Insurance Group. They also reported bad visibility between London and Hooton, and had called in at Wittering on the way, but not, as someone suggested, in order to take a quick course in flying by instruments! The D.C.A. and other distinguished visitors were entertained to lunch at the Liverpool Club, and in the meantime the general public began to arrive, and soon there was a considerable crowd in the enclosures. There was no sign of an improvement in the weather, but, on the other hand, Hooton was spared the rain from which some of the other controls suffered.

About 12.40 p.m. the loud speakers announced that something of a bolt from the blue (or rather grey) had just been received from the radio van, but the noise of a machine flying overhead prevented most from hearing what the "bolt" was. However, at 12.42 the "bolt" itself was seen approaching the aerodrome, and when it crossed the line at 12.43 it was found to be competitor No. 19, Flight-Lieut. Gibbons, in a Spartan (Hermes). As the machine had not, for some reason, been reported from Sherburn, there was considerable surprise at this very early arrival. As Gibbons had started from Heston at 6 hr. 17 min. 13 sec., he had been averaging 110.5 m.p.h., whereas he was handicapped at something like 103 m.p.h. A quick calculation by means of the very useful graph published in *FLIGHT* last week indicated that if he could maintain the same average speed over the rest of the course, Gibbons would cross the finishing line at Heston at 6.30 p.m., which was a good deal earlier than expected. Obviously he had not only found a few "knots" which



WELL TRIED! Miss F. J. Crossley, who gallantly piloted her Moth over the full 982.5 mile course of King's Cup Race, and was the only women competitor to finish.

the handicappers had missed, but also had flown a very good course, in spite of the very poor visibility.

After an interval of some 9 minutes, another competitor was seen to be approaching the aerodrome. This proved to be No. 11, Mr. Grierson, in a Gipsy I Moth. As he was so far behind a machine which had started much later, his chances did not look very bright, but there was, of course, room for all sorts of things to happen in a race of this kind.

When the third machine to cross the line at Hooton turned out to be No. 31, Flying-Officer Edwards in a Bluebird (Hermes), excitement grew apace. The high number indicated that he was a late starter, and a comparison of his starting time and his arrival at Hooton brought out the fact that his average speed had been no less than 110.5 m.p.h. If he could keep this up, he should arrive at Heston at 6.32 p.m., or very close behind Gibbons.

The rest of the competitors now arrived in somewhat scattered order, and, generally speaking, at considerable intervals. This was just as well, for, with the wind direction where it was, and the regulation that after crossing the line competitors had to make a left-hand turn and land, there would have been some possibility of a machine about to alight getting in the way of one just crossing the line. No. 34, the Comper "Swift" (Pobjoy R.1), arrived at 13.41, having averaged 116.5 m.p.h. since the start. This was scarcely sufficient, unless improved on the subsequent stages, to get a place, but, on the other hand, there was much satisfaction in the fact that the Pobjoy engine, the only new type in the race, was standing up well in the first strenuous flying test to which it had ever been submitted. Rodd, on a D.H. Puss Moth (No. 37), with Miss Peggy Salaman as passenger, had averaged no less than 127.5 m.p.h. to Hooton, and at that rate would reach Heston at 6.55 p.m., so that here was a distinct chance of place at least.

Miss Crossley was by that time the only lady pilot left in the race, and everyone was full of admiration for her pluck in carrying on in spite of the fact that she was among the 100-m.p.h. machines and arrived at Hooton nineteenth.

Healy, on the Genet-Avian, had been averaging 120 m.p.h. to Hooton. This was the speed at which he had been handicapped, but it was thought that he had "something in hand," and he was well in the running for a



FIRST IN FIRST ROUND: Fl.-Lt. Gibbons (Spartan), the first back at Heston on the first round of the King's Cup. (*FLIGHT* Photo.)



A VISITOR TO ALL CONTROLS: The three-engined Ford (Wasps) is here seen at Whitchurch (Bristol).

place at least. The refuelling arrangements worked smoothly, and one heard not a single complaint from any competitor. The three-engined Ford monoplane arrived about 2 p.m., and appeared to have visited all the controls during the day, its high cruising speed enabling it to cut across from one control to another in fast time.

By about 2.40 p.m. all the competitors had been sent away, and the spectators were treated to flying displays, joy rides, etc. Mr. Clapham, the school instructor, gave some very fine looping displays, but he might, without detracting greatly from their effectiveness, have carried them out at a slightly greater height. Coming out of a loop with the wheels some 10 ft. above the grass is thrilling to watch, but is cutting things a bit too fine.

When the last competitor, Mr. Jackaman, had left, taking off in a left-hand turn with the left wheel on the ground, Col. Shelmerdine made a tour of inspection of the Comper and Pobjoy works, accompanied by Mr. Dawson, of the Comper Company, and Mr. Pobjoy, of Pobjoy Airmotors.

The D.C.A. was obviously very interested to find that, in spite of their small size, the Comper and Pobjoy works are very well laid out for quantity production on quite a considerable scale. A number of "Swifts" were seen in various stages of completion, several of them being built for overseas purchasers.

In the Pobjoy works, Col. Shelmerdine saw the large stocks of component parts for this very interesting little engine, and some examples in course of assembly, while one was ready for its test bench run, the Pobjoy works including a very complete and up-to-date testing plant, on which the engines are run and given their passing-out tests. A very careful system of inspection is in force, and the Pobjoy R.1 engine promises to become very popular, what with its low specific weight and its airscrew gearing, which gives good thrust horse-power at take-off and for climbing. The fact that the Pobjoy in the "Swift" stood up to the gruelling race without giving any trouble promises well for the future of this engine.

After completing his inspection of the works at Hooton, the D.C.A. flew back to London in the Desoutter monoplane.

AT HESTON (Intermission)

During the afternoon several interesting displays were arranged by the management at Heston to entertain those present until the machines in the race should come round again. This consisted, in the first place, of a display of aerobatics by Herr Udet, who has become famous through his flying for the German films, particularly in the film: *The White Hell of Pitz Palu*. His exhibition, which he made on his own machine called the Flamingo, was beautifully done, and all his manoeuvres showed a smoothness and steadiness, the like of which we have seldom seen. After the machines in the race had passed through on their second lap Herr Udet went up

again, and after doing a good deal of inverted flying he cut his engine and before descending made two loops with the engine completely stopped, a most impressive manoeuvre and one which gained him great applause. Mr. Lowe Wylde was towed over from Hanworth about this time and cut loose when over the aerodrome, making several turns before landing his glider; subsequently he made two or three auto-towed flights and gave the crowd some idea of this type of gliding. Mr. Staniland, flying one of the Fairey Fireflies which has recently been completed for the Belgian Government, put up an exceedingly impressive show. The way in which he rolled the machine when climbing steeply and continued to climb afterwards until out of sight in the clouds, made one realise what an extremely fine machine the Firefly is. Despite its high speed, however, it can also be flown exceptionally slowly, and on several occasions he travelled across the aerodrome at what looked like about 60 m.p.h. with his engine merely ticking over. There was another display of inverted flying on a Moth by a well-known Service pilot, but who it was announced wished to remain anonymous. Actually, of course, he is pretty well the king of inverted flying in this country, and the smooth way in which he handled the Moth and made tight inverted turns and all other manner of evolutions showed that he has little to learn



THE SIDDELEY TROPHY: A. C. M. Jackaman (left) with the Siddeley Trophy which he won on the D. H. Puss Moth. Next to him is Comdr. H. Perrin, Royal Aero Club, and on the right Mr. V. Holeman, of Cirrus Hermes Engineering Co. (Flight Photo.)



SORELY TRIED AND NOT FOUND WANTING: The diminutive Comper "Swift" flown by Sqdn.-Ldr. Robb did not succeed in getting a place, but it did get in sixth, which was a very creditable performance indeed in view of the fact that the Pobjoy R.1 engine is an entirely new type. The engine gave no trouble whatever, a fact which promises well for the future of the Pobjoy R.1.

The "Swift," incidentally, was favourite on the "Tote." (FLIGHT Photo.)

about this particular form of flying. In spite of the rain, Capt. Stewart made a parachute drop with an Irving Air Chute, landing just where he meant to in front of the crowd, in a small enclosure which had been pegged out for the Autogiro to demonstrate from. Mr. Rawson had decided that one of the best ways to show off the Autogiro was to land it in a very small space, and on three occasions he put the machine down and took-off again from this enclosure. The Luft Hansa people very sportingly sent over the G.38, which flew round amidst the wind and rain, and, although she did not land, gave people a very good idea of her colossal size.

AT HESTON (First Round)

Shortly before 3 p.m. we got ready to receive the King's Cup machines on their first return to Heston, and at the same time the rain came down with increased vigour, so that there was another rush for shelter. Many of us, therefore, were somewhat unprepared when, just as Staniland took off once again on the Firefly, a King's Cup machine suddenly appeared out of the rain-obscured sky, and crossed the line at 14.56.01. This proved to be Flight Lieut. Gibbons on the Spartan, and some six minutes later the second machine, F./O. Edwards' Bluebird, followed him.

After an interval of about ten minutes the third man arrived, this being Grierson on his Moth, and eight minutes later Flight Lieut. Dawson, also on a Moth, came in. Another ten minutes passed, and two machines were seen approaching. These proved to be F./O. McKenna on the Spartan and C. S. Napier on the Widgeon.

From now on the competitors came in almost as fast as the rain was falling. Four minutes behind the last two came Lieut. Caspar John (Avian), with Lieut. Rodd (Puss Moth) one minute behind. Two minutes later "J. Wellworth" (Widgeon) crossed the line, and another two minutes separated him from Flight Lieut. Healy (Avian), while yet another two minutes came in between two more finishing together—Squadron Leader Robb (Comper Swift) and Lieut. Pugh (Spartan).

Only one minute behind these two came another pair—a case of extremes meeting, for they were Nos. 40 and 1 on the list—J. Balfour (Puss Moth) and J. Ormston (Widgeon). After a wait of four minutes the next man came along, T. C. Fawcett (Moth), and four minutes behind him was A. C. S. Irwin (Puss Moth).

After this, one minute later, we had another bunch, first L. O. Russell (Moth) and M. L. Bramson (Martlet), separated only by seconds, and then, one minute behind them, a flight of three—G. N. Wilson (Moth), J. C. Webster (Curtiss-Reid Rambler), and Lord Douglas Hamilton (Moth). A. C. M. Jackaman (Puss Moth) next crossed the line two minutes later, and then we waited 15 minutes before the last left on the list came along—Miss F. J.

Crossley (Moth). She—in common, as a matter of fact, with most of the other competitors—looked tired and weary, and she would have been perfectly justified in retiring then and there, but she pluckily decided to continue.

Of course, meanwhile, the above arrivals were being sent off southwards as soon as they had completed their necessary time "in control." It will be seen that 22 out of the 40 starters got back to Heston on the first round, and all of these started off on the final stages.

THE BRISTOL CONTROL

Weather conditions at the Bristol Municipal Airport at Whitchurch, on Saturday afternoon last, were scarcely conducive to record attendances, but, despite this, quite large crowds assembled in the various enclosures to await the arrival of the competitors on the concluding stage of the race for the King's Cup and, at the same time, to witness the display which had been arranged by the Bristol and Wessex Club. Many more, sad to relate, finding thrift an easy virtue, took up positions in neighbouring lanes and fields, to the detriment of the Club's coffers.

A cheerful tone was lent to an otherwise rather dreary outlook by the many-hued banners and trade signs of the various petrol and oil pumps, temporarily set up to service competitors' machines, by which, in fact, all the colours of the spectrum were well represented.

Fortunately for spectators and organisers alike, the rain abated somewhat during the course of the actual proceedings, so that all were able to enjoy in comparative comfort the formation flight by the Club's three "B" licence pilots, Captain Hall, Flight Lieut. Cope, and Mr. Cliff, in D.H. Moths.

Subsequently, Flight Lieut. Cope gave several exhibition flights and displays of aerobatics, which, although conditions were far from helpful, he carried out in most creditable fashion, to the obvious appreciation of the on-lookers.

Almost immediately before the first competitor was due, a diversion from the prevailing excitement was caused by the arrival of the Ford three-engined 16-seater monoplane G-ABHF, which had been eagerly awaited for some little time. Many took an early opportunity for the close inspection which was afforded them, and found it a much more difficult subject for criticism than Mr. Ford's erstwhile "flivver." Incidentally, the machine, when being run-up just prior to its departure after a stay of about an hour, almost spelt disaster to one of the Club Moths, owing to the tremendous slipstream from its propellers nearly lifting the lighter machine bodily off the ground. Willing hands, however, quickly averted the possibility of damage.

Meanwhile, Captain L. P. Winters, the Secretary of the Bristol and Wessex Club, and the official representative of the Royal Aero Club in charge of the Control, had everything in readiness for the arrival of the competitors.

At approximately ten minutes past five two machines were sighted flying low across the surrounding countryside, one close on the tail of the other, and, as they crossed the line, it transpired that the first was the Spartan piloted by Flight Lieut. Gibbons, and his pursuer the Blackburn "Bluebird" flown by Flying Officer E. C. T. Edwards. Ten seconds only separated them—an early thrill for spectators who were roused to quite a high pitch of excitement. Flying Officer Edwards had thereby picked up the eleven minutes or so which separated them on leaving Heston for the last circuit. Incidentally, Flight Lieut. Gibbons, in greeting his closest rival, inferred, may one mention, in the vernacular, that Flying Officer Edwards had already virtually won the race, which subsequently proved to be the case.

Nearly twenty minutes elapsed before the next arrival was sighted. This was Mr. John Grierson in a D.H. Moth, who was followed soon afterwards by Lieut. Rodd, piloting a Puss Moth. Not a little interest was shown in this latest arrival, and one hesitates to suggest that the male



OFF ON THE SECOND ROUND: Some of the competitors waiting for the signal to start from Heston on the second round of the King's Cup. (FLIGHT Photo.)

element were attracted only by the sight of Miss Peggy Salaman, who travelled as passenger, or yet that the ladies found the appearance of Lieut. Rodd, attired in grey flannels and a tennis shirt, more intriguing than the machine itself. Mr. Rodd's gesture of defiance to prevailing weather conditions, however, met with scant respect, for almost immediately after he had stepped from his machine a heavy storm swept across the aerodrome, and he was forced to seek shelter beneath the wings.

More thrills were to follow, for two machines then arrived, flying almost neck and neck—seven seconds only separating them. They were the D.H. Puss Moth and the Avro Avian Mark IVM, flown by Mr. Balfour and Flight-Lieut. Healy, respectively. Squadron-Leader Robb, in the Comper Swift, came in shortly afterwards.

Competitors were one and all unanimous in their agreement that the flying conditions they had experienced were particularly atrocious. Many, it appeared, owing to the low-lying clouds, had been subjected almost to "blind" flying since leaving Heston.

News came to hand about this period that Mr. M. L. Bramson had been forced to return to Shoreham, although no reason was vouchsafed.

Within the following 20 minutes as many as ten machines crossed the line, so that the spectators were never at a loss for something of interest, and there could not have been a dull moment—indubitable proof of the qualities of the race from a spectacular standpoint.

About this time it was noticed that, for some inexplicable reason, several competitors, after crossing the line, made right-hand turns preparatory to landing, instead of the left-hand turns laid down in the race regulations.

The entry from the Dominions, the Curtiss-Reid Rambler, came in for much attention, and sincere sympathy was expressed on all sides at Mr. J. C. Webster's now somewhat hopeless position of finishing amongst the leaders; he was the fifteenth to arrive.

Machine No. 3, piloted by F/O. McKenna, was the eighteenth machine to cross the line, but owing, one was informed, to engine trouble, it was subsequently withdrawn from the race.

The first machine to leave Heston at the commencement of the race arrived nineteenth, at about a quarter past six, but it was nearly ten minutes to seven before Miss F. J. Crossley, the only woman still in the race, came into view. Owing to some misunderstanding, she landed without crossing the line, and it was only after various officials had indulged in the wildest gesticulations that she taxied around and crossed in flight as required. Subsequently she came in for no little attention, and, although obviously tired after her arduous flight, greeted the many who swarmed round to congratulate her on her perseverance and pluck with a ready smile.

The last to arrive was Mr. L. O. Russell, flying a D.H. Moth. Apparently compass trouble had developed after leaving Heston on the last circuit, and he had been forced to alight at Sarum to enable the necessary adjustment to be carried out, and consequently much time was so lost.

Long before many of the machines had departed on the last 94 odd miles to Heston after their compulsory stay of 40 minutes, the result of the race had been announced to the crowd through the medium of the *Evening Times* broadcasting van, which was also the means of keeping everyone well acquainted with all arrivals and departures.

An outstanding feature was the perfect organisation and efficiency resulting in absolute smoothness of working con-

ditions which characterised the proceedings at the control. The genial Captain Winters, who was in charge of affairs, is, together with the numerous members of the Bristol and Wessex Club, who rendered invaluable assistance, to be congratulated on the highly successful results obtained from his and their efforts.

AT HESTON (The Finish)

From about 5.30 the weather got worse and worse (if possible), and while we were waiting for the arrivals at Bristol to come in, it was anticipated that there would be several retirements before the final Heston arrivals. Actually, however, only one dropped out—M. L. Bramson, on the Martlet.

It was shortly after 6.30 that the winner was observed hurrying home out of the dark rain clouds. This was F./O. Edwards (Bluebird), who had overhauled Flight Lieut. Gibbons (Spartan), with whom he had been flying neck and neck. The latter, however, came in second, only three minutes behind. The third man home was Lieut. Rodd (Puss Moth), 17 minutes later, and in under five minutes we saw a fight for fourth place between J. Balfour (Puss Moth) and Flight Lieut. Healy (Avian), the former obtaining it by 25 seconds.

After the sixth man—Squadron Leader Robb (Comper Swift)—had come in, nine minutes later, there was another tussle between two Puss Moths, piloted by A. C. M. Jackman and A. C. S. Irwin, only 33 seconds separating these two.

Then, at intervals of two and one minutes respectively, C. S. Napier (Widgeon) and Flight Lieut. Dawson (Moth) came in ninth and tenth. The next five followed each other in rapid succession—the eleventh being No. 11; J. Grierson (Moth), then, 50 seconds later, "J. Wellworth" (Widgeon), next; after one minute, J. C. Webster (Curtiss-Reid) and Lieut. Casper John (Avian), with four seconds between them; and next Lord Douglas Hamilton (Moth), 49 seconds behind.

There were now only six competitors to be accounted for, and two of these, Lieut. Pugh (Spartan) and T. C. Fawcett (Moth) arrived home, fairly close together, some nine minutes after the previous man. A wait of about a quarter of an hour brought in the "limit" man, J. G. Ormston (Widgeon), and G. N. Wilson (Moth) came along about ten minutes later.

It was now 8 o'clock, and meanwhile we had received no news of Miss Crossley, and, as weather conditions were still as vile as ever, there was naturally some anxiety felt on her account. Thus, it was with considerable relief—and perhaps surprise, for under the circumstances we were waiting for news of her retirement—that at 8.20 p.m. we saw her machine cross the line! All agreed that it was a magnificent effort on her part—a feature of the race, in fact—for not only was she the only woman pilot to complete the course, but she had previously done comparatively little flying.

Three minutes behind Miss Crossley came L. O. Russell (Moth), which completed the list of 21 due back at Heston. And so ended the 1931 King's Cup Air Race—no doubt a very interesting one, but certainly one of the most unpleasant, so far as weather conditions, yet held.

The winner of the King's Cup was, therefore, F./O. E. C. T. Edwards, on Robert McAlpine's Blackburn Bluebird IV (Cirrus-Hermes I), his average speed for the course being 117.8 m.p.h. Flight-Lieut. F. G. Gibbons

was second on his Spartan (Cirrus-Hermes II) with 109.1 m.p.h., and Lieut. G. Rodd, on Miss Peggy Salaman's Puss Moth (Gipsy III) was third with 127.5 m.p.h. Lieut. Rodd also won Lord Wakefield's prize for fastest time over the course.

The winners of the Siddeley Trophy, which was flown concurrently with the King's Cup, were as follow:—1st, A. C. M. Jackaman, London Aeroplane Club; 2nd, J. C. Webster, Montreal Light Aeroplane Club; 3rd, Lieut. Caspar John, R.N., Hampshire Aeroplane Club.

In conclusion, it should be mentioned that 1st, 2nd and 3rd machines in the King's Cup, the 1st in the Siddeley

Trophy, and also the machine with the fastest time, were all fitted with Smiths' instruments and Huson compasses. For the tenth year in succession, K.L.G. Plugs topped the list and took a load off the mind of many of the competitors. Other contributions to success were Dominion "Acme" spirit, "Castrol," "Cellon" (four out of the first six to finish, including 1st and 2nd, used this dope), and "B.T.H." magnetos. The very fine performance, under such vile climatic conditions, of the Cirrus-Hermes engines was also worthy of special note. National Benzole was used by Lieut. Gibbons in the Cirrus-Spartan which brought him in second.

A JAPANESE LIGHT AIRCRAFT

THE Ishikawajima Aircraft Company have produced a two-seater single bay light aircraft somewhat reminiscent of the Moth and Avian called the R.3. This will be fitted with either the Cirrus III or Hermes II engines, for both of which the same Company hold the manufacturing rights.

The chief designer, who is Mr. Yoshihara, claims that particular attention has been paid to high factors of safety, performance, exceptional flying qualities and low maintenance costs.

The machine is said to possess remarkable manoeuvrability, while the controls are so effective that any type of aerobatic evolution can be managed with ease. The take-off has received particular attention, since in Japan, landing fields, when existent at all, are of a very limited size.

During the next Spring the Tokio Student Union have arranged to send someone on a production model R.3 to Europe via Siberia. The proposed route being from Tokio via Siberia to Poland, Berlin, Brussels, London, Berlin and finishing in Rome.

Constructional Details.—The fuselage is built up of welded steel tubing and is wire braced, particular care having been taken that both pilot and passenger have ample cockpit space together with exceptional leg room. The engine mounting is attached to the fuselage by four bolts only, and is built up from Duralumin channels reinforced by a curved Duralumin plate underneath the engine, which also serves as cowling. The wings are all wood construction, with a three-ply leading edge, and are fabric-covered. The spars are all boxed spruce and three-ply. The ply leading edge is somewhat different to that usually



The clean lines of the Ishikawajima R3 make it look attractive and presage a good performance.

used in this country, since it is also extended back underneath the wing to the bottom of the rear spar with fabric over it.

A patent held by the Ishikawajima Aircraft Co. also arranges that the aileron hinge points are fitted in such a manner which, it is claimed, compensates for yaw and reduces rudder movement necessary in turning. The ailerons themselves are very light and are constructed of duralumin channel. The interplane struts are streamline steel tubing.

All tail surfaces are similarly constructed of Duralumin channel, and, though very light, are extremely rigid and well braced by tubular steel struts of streamline cross section. The landing gear uses oil and rubber discs in compression for shock absorption, and is of the open type without a cross axle. The tail skid is steerable and sprung with rubber discs in compression. The fuel supply is direct by gravity from two 14-gall. tanks of aluminium in the upper centre section.

The "A.A." and Aviation

THE Automobile Association held their twenty-sixth annual meeting on July 15. The chairman, Mr. C. McWhirter, said that more than 27,000,000 miles were covered during the past year by patrols of the A.A., and that there was an increase of membership from 419,000 to 437,000. As regards aviation, the services rendered by the Aviation Department, particularly in connection with foreign air tours, had increased. Over a million miles had been covered by flying members. The Carnet de Passage en Douanes was now usually double the size of that issued during the previous year, showing that the tendency was towards longer routes; the period of validity was extended from six to twelve months. A.A. air route maps issued for foreign tours exceeded 400,000 miles. The A.A. Air Message Service (approved by the Air Ministry) was proving a material help in emergencies. The Association was recognised by the Air Ministry as competent to inspect and report upon sites for Civil Aerodromes. Special provisions were made for the benefit of members flying to the Ulster T.T. Motor Races. The services of the department had been freely used by famous aviators undertaking long flights to all parts of the world.

"Riviera News"

WE have just received from its editor—our old friend Douglas Thorburn, who will be remembered by all associated with pre-war flying days in England—the first issue of a new illustrated journal in English called *Riviera News*, published in Cannes. The reason for its appearance is explained in an editorial introduction, thus: "... The Riviera is extremely accessible from all parts of Europe. Luxurious express trains, complete with motor transport for the patronage of visitors, while the creation of the new aerodrome at Cannes has reduced to five or six hours the journey south from London or Paris. ... The Anglo-American community is large and influential, and always increasing. For that reason the *Riviera News* has been created with every confidence in its success." Judging by this first issue, we also share that confidence, and have no hesitation in wishing it the success it deserves. Anyway, the first number is full of interesting matter, including, of course, aviation items. The *Riviera News* will be published fortnightly in summer and weekly from November to the end of April, price 3 fcs. per copy. The editorial and publishing offices are at 21, Rue des Etats-Unis, Cannes.

THE CIRCUIT OF ITALY

Triple Win for "Breda" and a Triumph for British Engines

WE had hoped this week to publish a full report of the Circuit of Italy Air Race, but, owing to the extreme pressure on our time and space in connection with our report on the King's Cup Race, we are afraid we can only, for the present, give our readers a brief *résumé* of the results of Italy's affair. Next week, however, we will give a fuller report.

The Circuit of Italy was flown over the following six stages, totalling 5,885 km. (3,657 miles):—(1) Rome-Palermo (1,071 km.); (2) Palermo-Rimini (1,175 km.); (3) Rimini-Venice (1,104 km.); (4) Venice-Milan (1,113 km.); (5) Milan-Turin (491 km.); (6) Turin-Rome (931 km.). As stated last week, the competitors were divided into two categories, the second category being introduced by the Italian authorities—thanks to the efforts of Lt.-Col. Bitossi, Italian Air Attaché in London—in order that the D.H. "Puss Moth," which normally just came outside the weight limit fixed for entrants, could take part in the race. This creation of the "Grande Turismo" was certainly a sporting act on the part of Italy that will be highly appreciated in this country. Four "Puss Moths" were thus able to take part, these being M. Nathan and G. Folonari (Italy), Hubert Broad (England), and R. Fietz (Switzerland). However, these four, together with those in the main category—about 37 in all—started on July 17, and, as previously reported, the first to complete the first stage was Colombo on the Breda 33, Meleri following a few minutes behind on a similar machine. R. Poss (Germany), on a Salmson Klemm, was third, and



Sig. Ing. Ambrogio Colombo, the winner of the Circuit of Italy Air Race. He was flying one of the New Breda 33 low-wing monoplanes, fitted with a Gipsy III engine.

De Angeli, on a Breda 15.S., was fourth. The order in the second category was: Nathan, Broad, Fietz, and Folonari.

The two Breda 33's—which are fitted with Gipsy III engines—maintained the lead throughout, although Meleri lost time on one of the sections with minor trouble, but regained his position on the next stage, and towards the end De Angeli, on the Breda 15.S. (which was also fitted with a Gipsy III), came up into third place. Lusser (Germany), on a Klemm, later came up into fourth place, which position he retained until the end. In the second category Broad obtained the lead in the third stage, Rimini-Venice, which he maintained throughout. The third and fourth stages, it should be mentioned, were extremely difficult ones, consisting of a series of zig-zags over bad country, and proved a

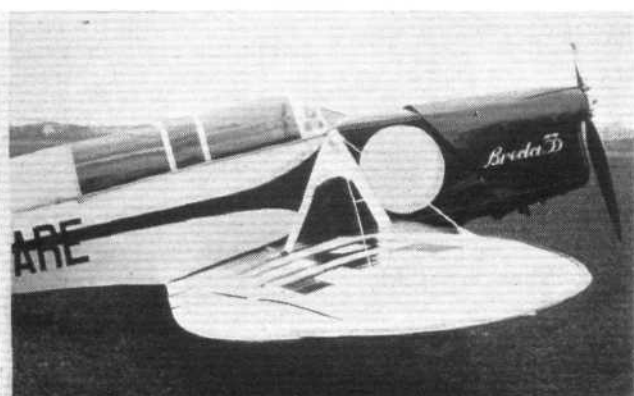
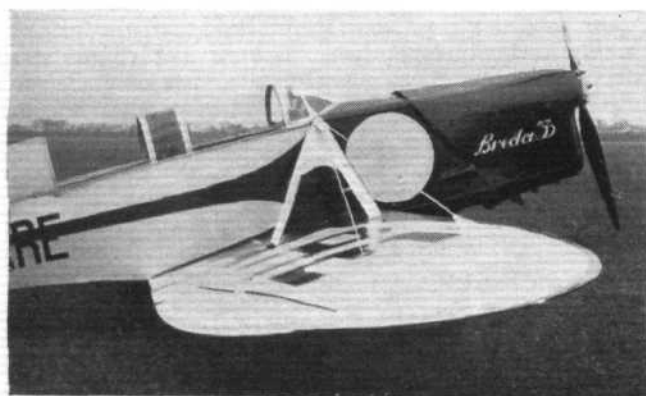
very severe test for both pilot and machine.

The final results of the race were announced as follows:—

First Category (Tourist Machines).—1, Colombo (Breda 33 aeroplane, Gipsy III engine), time, 35 hr. 35 min. 7 sec.; 2, Meleri (Breda 33 aeroplane, Gipsy III engine), time, 39 hr. 56 min. 11 sec.; 3, De Angeli (Breda 15.S. aeroplane, Gipsy III engine), time 41 hr. 5 min. 5 sec.

Second Category (Grand Tourist Machines).—1, Captain Broad (Puss Moth), time, 37 hr. 42 min. 24 sec.; 2, Nathan (Puss Moth), time, 37 hr. 44 min. 48 sec.; 3, Fietz (Puss Moth), time 40 hr. 26 min. 41 sec.

It is of interest to note that out of the first eight machines to finish, seven were fitted with Gipsy engines.



Two views of the Breda 33 Monoplane ("Gipsy III"), showing the sliding windows to the cockpit open and closed.

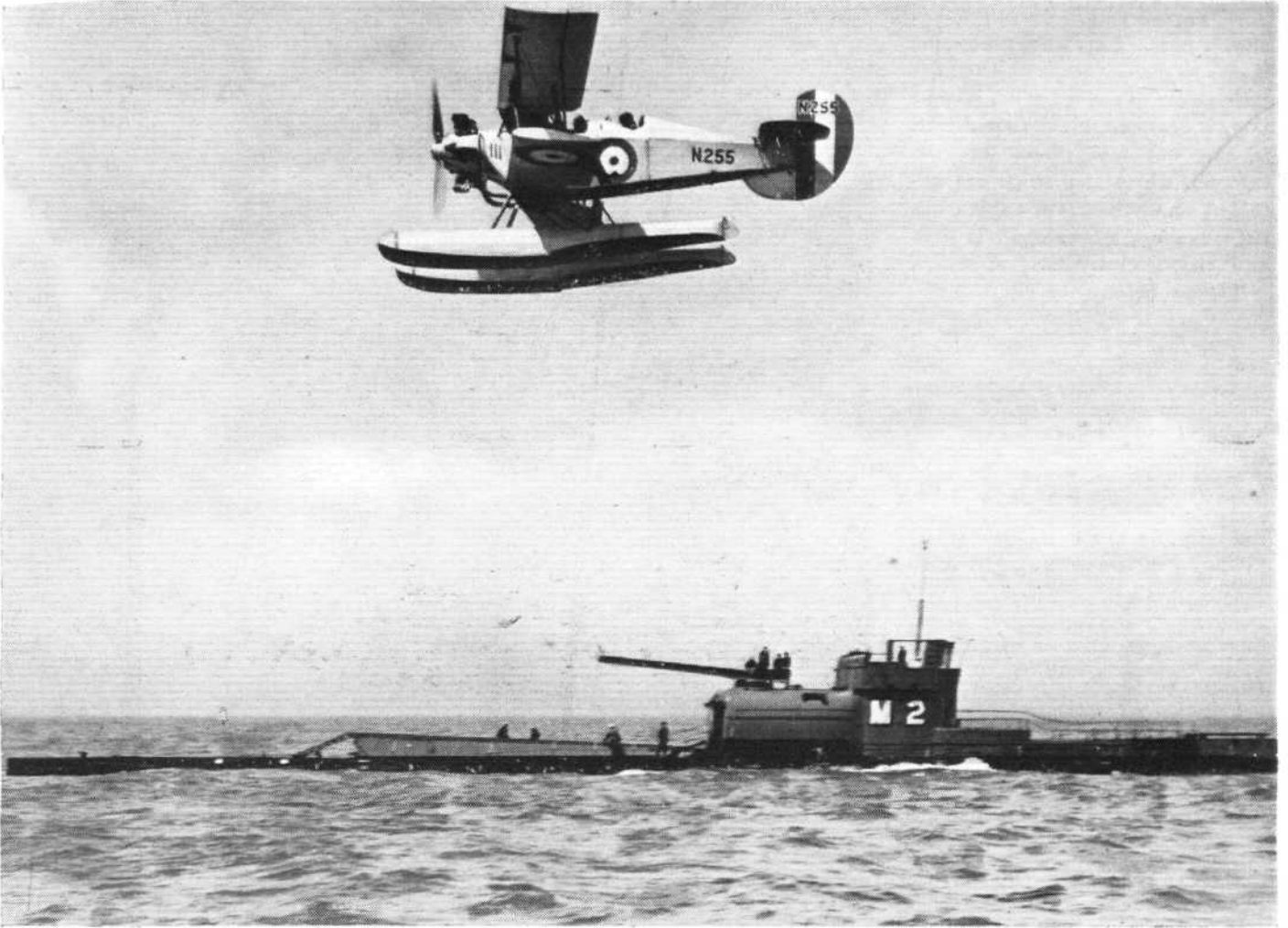
The Schneider Contest

SQUADRON-LEADER ORLEBAR was recently taxiing the new Supermarine-Rolls Royce S.6 when two barges crossed his path. One of the wing-tips was damaged, and the machine was sent to Woolston for repairs. It was returned to the High Speed Flight on July 27 after a new wing had been fitted.

The other S.6, which sank after a hurried landing by Flight-Lieutenant Linton Hope, has been salvaged, and is undergoing repairs. The pilot was unhurt, but none the less Flying Officer G. L. Brinton (Lieut., R.N.) has been recalled to the High Speed Flight. An advance party of

the Italian team will arrive at Calshot on August 12. This party will consist of two officers, 10 men, and three practice seaplanes. The remainder of the team, namely 12 officers and 40 men, will follow on August 26. The Italians are bringing their own pontoons from Italy. In 1929 they were supplied with a large pontoon by the R.A.F.

The French team has placed orders for pontoons to transport their seaplanes to be made in England. For the benefit of our Canadian and American readers, we would point out that by "pontoons" we do not mean "floats," but special boats for transporting the seaplanes.



The Parnall Peto flying past H.M. Submarine M.2. (FLIGHT Photo.)

A SUBMARINE AIRCRAFT CARRIER

"PER MARE PER COELUM" is the motto of this unique aircraft carrier, in which we were recently privileged to make a trip. Although frankly an experiment, she has proved satisfactory and the lessons learnt should very materially help future developments

MOST people are aware that aircraft are operated from ships called aircraft carriers, but very few know that one of our aircraft carriers is a submarine. This is the M.2, and is one of our largest submarines, which was first commissioned on November 5, 1919. At that time, however, she had a 12-in. gun in a turret forward of the conning tower, with a 3-in. gun aft, which, together with her four 18-in. bow torpedo tubes, formed her offensive armament. She was one of three such boats with which it was hoped to do considerable damage in the latter stages of the world war, 1914-18. They were all of some 1,600 tons surface displacement and 1,950 tons submerged displacement, with a length of 305 ft. Their engines were two sets of 12-cylinder Diesel engines, giving a total h.p. of 2,400 and a surface speed of $15\frac{1}{2}$ knots; their electric motors total 1,600 h.p., with an under-water speed of approximately $9\frac{1}{2}$ knots. None of them, however, were commissioned early enough to do very much, although the first of the class, M.1, was sent out to the Dardanelles.

Later on, when it was decided that the operation of aircraft from a submarine should be tried out, M.2 was taken in hand and altered for this purpose. The gun turret was completely dismantled and a hangar built in its place in front of this. She was then commissioned as a carrier in 1927, the aircraft being slung out with a derrick and taking-off from the sea.

In October, 1928, it was decided to advance a step further, and on the top of the bow portion of the boat

was built up a catapult similar to that used for launching aircraft from other ships, but in this case worked by compressed air instead of a cordite charge.

Parnall & Co., of Bristol, were the company who produced an aircraft suitable for the purpose, and this was naturally no mean task, the limitations of size imposed by the dimensions of the hangar being a very serious obstacle. Eventually, however, the Peto, as the aircraft was called, was finished, and this was described in FLIGHT for July 11, 1929. In the first place, this machine was fitted with the Bristol Lucifer engine; now, however, an Armstrong-Siddeley Mongoose is used instead, giving a considerably increased performance. The aircraft, of course, differs somewhat widely from the usual idea of a service craft inasmuch as it does not carry offensive armament. It is a two-seater folding-wing biplane with the top plane of greater span and cord than the lower. The interplane struts are of the rigid steel tube type, and everything has been made as compact as possible. Similar to small privately-owned light aircraft, the pilot is placed in the rear position, with his observer in front of him, and the only equipment carried apart from that used for ordinary navigational purposes is the wireless set, which is placed in the observer's cockpit, and in front of him. When in the hangar, this little twin-float biplane is locked upon a carriage resting on two rails, and when the large door in front of the hangar is raised and shut mechanically, there is not a great deal of room to get round the machine, as may be well imagined. The hangar crew, however, of

UP INTO ACTION

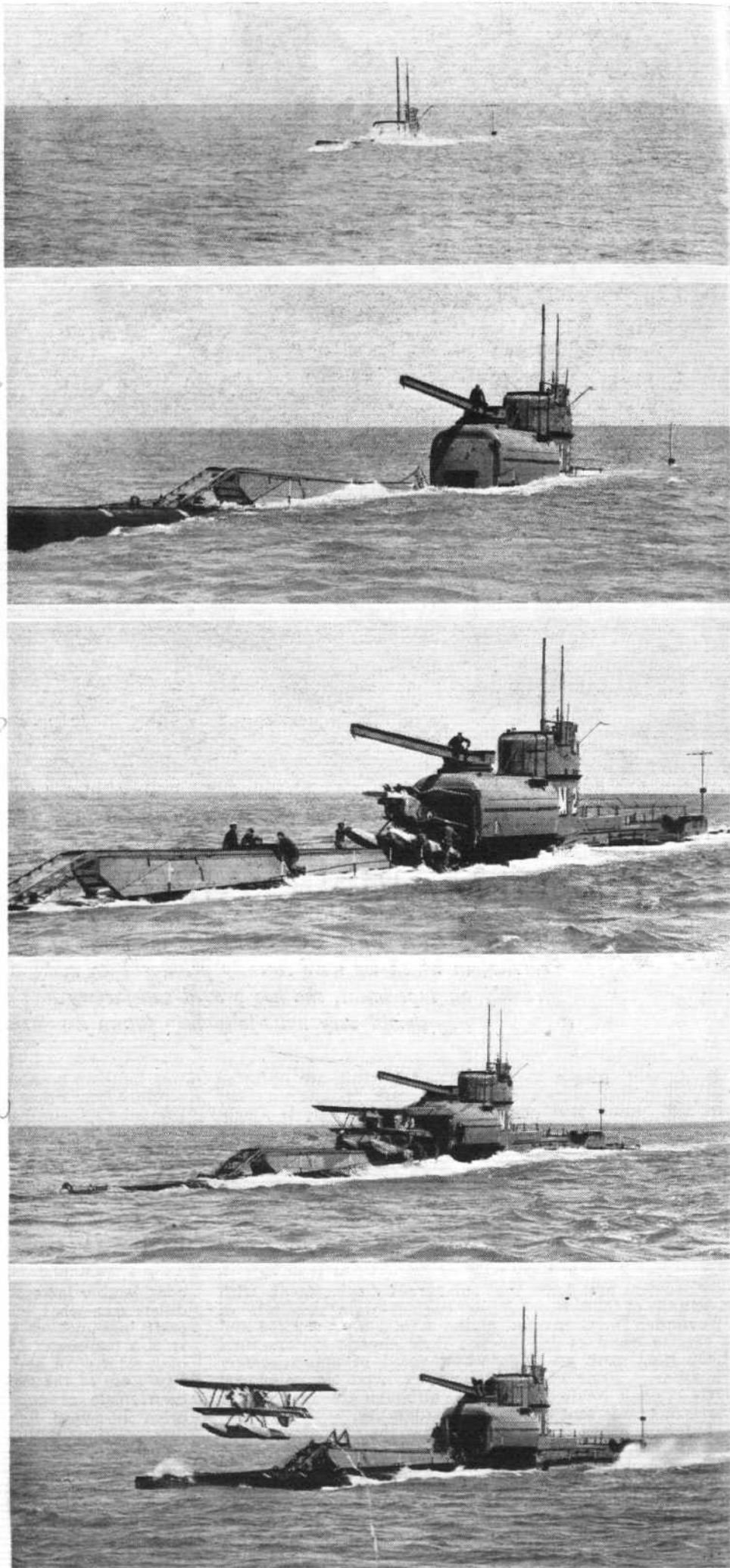
The sequence of operations is shown here. First the submarine comes to the surface, and when the bow is clear of the water the hangar door is opened. Next the aircraft is run out and placed on the catapult, where the wings are unfolded, finally, after the engine has been run up, the catapult is fired and the aircraft flies off on a reconnaissance flight.

(FLIGHT Photos.)

ten men, find corners in which to squash themselves when standing by to open the hangar door and get the aircraft away on coming to the surface. For an aircraft of this type to be used successfully, speed in getting her away is, of course, essential, and the procedure for doing this is roughly as follows:—We will assume that the boat is cruising at her normal diving depth of some 35ft.; the pilot first ascertains from the Captain of the ship as to when he is likely to come to the surface, and some time before this gives the order for the electrical, oil and engine heaters to be started up. By this means the lubricating oil in its tank and the engine itself are both warmed to an appreciable degree, thereby enabling the engine to be started up faster than otherwise could be done. It is not, of course, possible, actually to start up the engine while down below, and it is for this reason that everything feasible is done to shorten the time required in running up when once the boat is on the surface.

The crew are standing round the machine and dressed in long waders, since if there is any sea running some water will sure to wash into the hangar when the door is opened. This, of course, is prevented from going right down into the boat by a high coaming around the hatch leading below. As soon as the boat reaches the surface, the order is given to open the door, and the large slab of steel falls down flat in front of the hangar, forming a platform over which rails are quickly laid connecting those in the hangar with the ends of the catapult rails. The aircraft is then immediately run out on its trolley and locked into position on the after end of the catapult; the wings are at the same time unfolded and secured in position.

Each man, of course, has his allotted duty, and while some are locking the wings others are attending to the engine, opening the petrol and oil cocks and preparing for running up. As soon as all is ready, the engine is started, and allowed to warm up for a few seconds; the pilot and his observer have in the meantime donned their flying equipment, together with life-saving jackets and such other paraphernalia as they are ordered to wear, and then take their places in their respective cockpits. The Warrant Engineer, who is responsible for



DOWN TO SAFETY

After having carried out the reconnaissance flight the little sea-plane alights near the submarine where the derrick is already trained over the ship's side. The aircraft then taxis up and is hooked on, lifted up and swung on board and placed on the catapult rails. After the wings are folded it is pushed back into the hangar, which is closed, and once more the submarine dives out of sight.

(FLIGHT Photos.)

the successful working of the catapult, has by this time assured himself that there is adequate pressure in the reservoirs, and that his men are standing by to release the aircraft when the order is given.

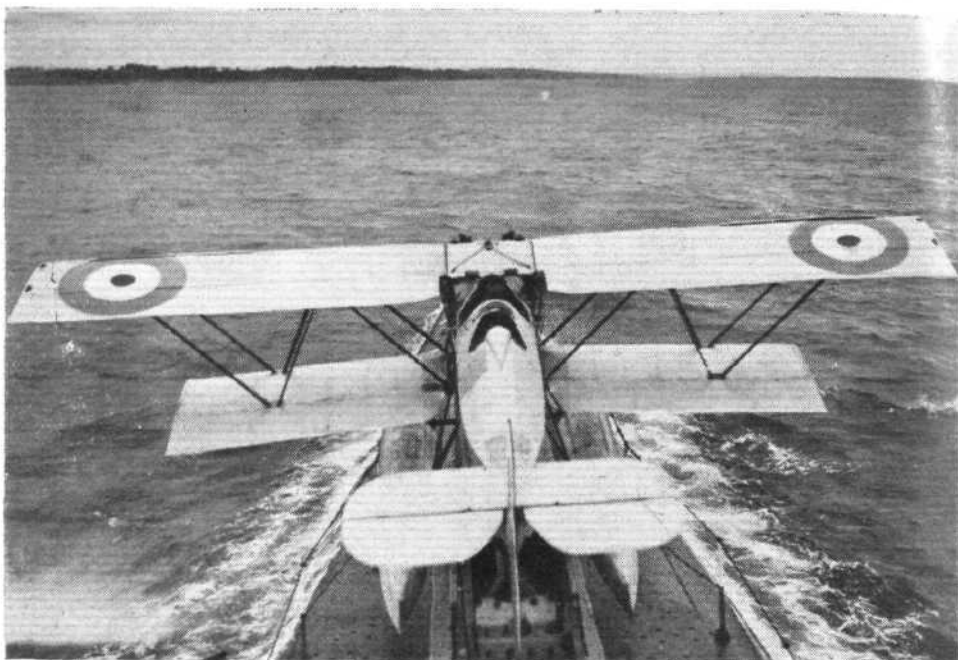
The Captain will have had the Diesel engines started up and the ship turned into wind, steaming at such a speed that there is a sufficient air speed showing on his gauge in the conning tower to ensure a clean take-off. The pilot then opens the engine full out, and, when he is satisfied that it is running correctly, he intimates to the Captain by raising his hand that all is ready.

The man who actually pulls the release, and thus operates the catapult, is a stoker, and he, with his hand on the lever, watches a seaman, who passes the order to release from the Captain. The catapult then shoots forward, and the aircraft attains a high speed by the time it reaches the end of the rails. This, in view of the fact that the engine is already running at full speed, is adequate to take the Peto straight off, and on both occasions when we saw it launched there was no wavering or drop whatsoever, but she flew perfectly cleanly and steadily straight into the air. This was somewhat amazing when it was realised that the impetus given by the catapult was so great as to reach this speed in such a short space. Of course, in doing so both the pilot and the observer are naturally banged against the back padding in their cockpits, and we certainly anticipated that under these conditions the pilot would find it impossible to handle the control column, and, therefore, the elevators, with much smoothness. On this particular day the weather was somewhat rough for landing such a small aircraft whose undercarriage was perfectly rigid, and again we anticipated more trouble than was actually the case. We gather that the Peto is not a particularly easy aircraft to land, since its speed range, due to the aforementioned limits imposed by the hangar, is very small, and it has therefore to be landed somewhat fast. However, Lieut. Villiers, who has now made a large number of successful flights from M.2, landed quite successfully between the tender and

submarine, and taxied up to the derrick, which, it will be seen from the photographs, is mounted on top of the hangar. The officer in charge of this derrick has by no means an easy task of lowering the hook between the observer and the airscrew, so that the former may hook on to the slings on the top centre section. The aircraft is then lifted clear of the water and swung in, and lowered on to the rails, the wings folded, run back into the hangar, and the door closed. The submarine is then once more ready to dive.

As things are at present, the time taken to come up from dive depth and get the aircraft flying is several minutes, while the time taken to do the reverse procedure, that is, get the aircraft on board and dive again, is about the same. Of course, the combination of M.2 and the Parnall Peto can only be looked upon as an interesting experiment, which should give valuable information as to the developments which may be expected for such craft in the future. Both the submarine and the aircraft are attempts to use existing material instead of building what is really required, as the size of the submarine is limited by the Washington Treaty, and M.2 is therefore the largest we are allowed to use, while the aircraft designer has had to design an aircraft to get on board this particular submarine.

It is well known that aircraft carriers of the normal type are exceedingly vulnerable, and also, due to their



LETTING HER GO: Looking down on the Peto just as the catapult was fired.
(FLIGHT Photo.)

large upper works, make a particularly large target to the enemy; it would, therefore, be folly to let an aircraft carrier precede the fleet in order that its aircraft might be used as scouts. True, their aircraft are so used, but, since the carriers have to be with the fleet for protection, their range of action is very considerably diminished. If, however, a large submarine was built with a high surface speed, she could very profitably be



THE HANGAR CREW: Above (left to right) are Able-Seaman E. A. Evans, Stoker J. Drummond, Chief Engine Room Artificer C. Hardy, and Able-Seaman R. Smith. In the front row are Warrant Engineer E. P. Birkett, Leading-Aircraftman L. Gregory, Lieutenant T. H. Villiers, R.N. (pilot), Lieutenant C. R. Townsend, R.N. (observer), Leading-Aircraftman F. J. Harman and Able-Seaman G. England. (FLIGHT Photo.)



used a considerable distance ahead of the fleet, as she need not come up and launch her aircraft into the air until everything was seen to be clear, and the aircraft could then proceed far ahead and wireless back a report of anything she might sight. A high cruising speed for the submarine would naturally be necessary, otherwise she would be unable to remain in front of the fleet; similarly, the time taken to launch and re-embark the aircraft would have to be an absolute minimum in order to maintain the submarine's position with regard to the main fleet. We are, unfortunately, not allowed to give any details of the catapult, but we gather that it has given absolutely no trouble; the compressed-air method of working it, therefore, would appear to be entirely satisfactory. The Peto is able to use her wireless equipment for direction finding, and the M.2 has, of course, the reciprocal equipment on board, and exercises of mutual D.F. work are constantly carried out. On the whole, therefore, it can be claimed that, while this experiment is by no means finished, it at least shows very great promise for future developments.

A bow view which shows how small the seaplane is and the small target offered by a submarine when head-on. The Peto is here in position on the catapult rails and is all ready for launching. The rails being fairly high hold the aircraft clear of all obstructions and it is not therefore, necessary to dismantle any of the handrails and stanchions.

(FLIGHT Photo.)



GLIDING



LONDON GLIDING CLUB.—For the previous six weeks the wind was only on the face of the site at Dunstable Downs twice during mid-week. On those occasions Miss Nicol and Mr. Richardson seized their chances to make one-minute flights, with "S" turns, to complete their "B" tests on the Dagnall primary. Messrs. Morland and Robertson were also on the spot and qualified for "C" licences in the Prüfling.

The first machine in the air on Saturday, July 18, was the new high-efficiency "Phantom" of the Cloudcraft Company, with "Mungo" Buxton at the stick. He got away at 5 p.m., quickly gained about 60 ft. above the ridge and stayed there with ease. He put up the British duration record to four hours fifteen minutes. Messrs. Scott-Hall and Culver secured their "C" licences on the Club Prüfling. Mr. D. C. Smith took up the "Hols der Teufel," belonging to Mr. D. Hiscox, for its first soaring flight. He remained up 20 minutes, and put it down again on the top close to the starting place. For some time three machines were soaring at once, and most of the time two were in the air. Later, Mr. Bolton secured his "C" licence on the "Hols" with 7½ min. Meanwhile Messrs. Abdallah, Slater and Dent polished off their "B" tests on the Dagnall. Altogether, it was quite a field day, with a total of 6½ hours' soaring.

Conditions on Sunday were as good, the wind being absolutely square on the hill. The Prüfling was now busy soaring in the hands of Morland, Smith and others.

Mr. H. Allan rushed back to London for his new Scud, and was rewarded by qualifying for his "C," putting up about 12 min.

The famous Prüfling "Thistledown" should be in commission again next week-end. Club and private craft will then total eight, so that intending new members may be sure of a machine being available for instruction. Application should be made to the Secretary, at Empire House, E.C.1.

THE SOUTH ESSEX AERO CLUB has now amalgamated with the Essex Gliding Club, and will henceforth be one club, to be known as the Essex Aero Club. The club now possesses two machines, a large hangar, towing car, etc., and a gliding ground at Havering.

Being thus equipped the committee have been able to fix the fees for flying members at entrance fee 10s. 6d., annual subscription £1 1s. Non-flying members are catered for at a reduced rate.

A workshop has also been provided, and the social side of the club will be followed at the members' wishes.

The club now has four instructors, three possessing R.A.F. experience, and one, viz., Mr. Wilson, who has just returned from a two months' course in Germany, where he has succeeded in obtaining his A, B and C certificates, and has also qualified as a passenger-carrying glider pilot.





The Air Exercises

By MAJOR F. A. de V. ROBERTSON, V.D.

(Concluded from page 733)

TUESDAY, JULY 21.—In previous years I have found that one of the best spots from which to gain a general idea of day attacks on London is the Duke of York's Headquarters at Chelsea. There is a camera obscura there—in fact, there is one at practically all the targets—and the camera is made the target. It represents a building which is supposed to be the seat of Government of Redland. Beside it stands a wireless lorry, manned by R.A.F. personnel. A number of the wireless hands employed are actually men under instruction at the Electrical and Wireless School at Cranwell, who are considered sufficiently trained to be able to carry out work "in the field." They do remarkably well, get some excellent practice, and naturally are greatly encouraged in their studies by having some experience of really interesting and important work. So thither I wended my way on Tuesday evening.

At a Camera Obscura

A camera obscura consists of a small closed tent, with a lens at the top, and a large sheet of paper spread out on a table. The bomber squadrons in the air keep reporting their position by wireless, and the calls are picked up by the wireless lorry. Of course, they receive calls from squadrons which are hunting other objectives besides Chelsea. As I waited, a squadron was seen away to the south-east, which reported itself as No. 207 B.S. (Fairey III.F), and was probably bound for the West India Docks. We knew that it was the "Harts" of No. 33 B.S. which were after our blood this evening. No. 12 B.S. had also originally received orders to attack Chelsea and the seat of Government, but had later been diverted to a low-bombing raid on Northolt aerodrome.

The first wave of bombers had crossed the coast at 6 p.m. The second wave was due to cross at 6.30. Our friends of No. 33 B.S. were in the second wave. They arrived a little before they were expected. At 6.40 we sighted the squadron flying in V formation, with the wireless machine cruising about in the rear. The appearance of the V, instead of the more usual "squadron formation," rather surprised us, and we wondered what Squadron Leader Waller had in his mind. An officer with war service who was near the camera recalled that his squadron always used the V for bombing in the war. Possibly it presents a harder target for a "brown" by the Archies. At any rate, it was a very imposing sight to watch No. 33, and we all admired the way in which the nine "Harts" kept their formation.

At the same time another squadron was seen to the rear of the Harts, not flying up from the south towards us as No. 33 was doing, but heading eastward. This squadron was spread about over miles of sky. The leading flight

was in good formation, but at first it was hard to be sure that the other six machines belonged to the same squadron, until they began to close up. No one happened to have any binoculars handy, and so the type of machines could not be identified.

No. 33 came on, stately and undisturbed. The lens showed the ten little shadows moving across the paper in the camera obscura. A metronome was ticking, and at each tick a pencil mark was made on the paper at the spot where the leading machine of the squadron was at that moment. These ticks gave the course and the ground speed of the squadron. It had to tell the camera its own height. The Harts were quite plain to the naked eye, and the sweep back of the upper planes, and the dihedral of the lower planes could be clearly distinguished. We all judged them to be about 7,000 ft. or so above us. They signalled, however, that they were at 11,400. Then a puff of smoke appeared below the leading machine. The bombs had been released. There was practically no wind, and the smoke hung almost motionless for quite a considerable time. A buzz on the wireless gave more accurate information to the camera of the moment at which the bombs were released. The mathematicians now had all the factors—height, ground speed, direction, etc.—and they knew the time which it would take for a bomb to fall from that height. In a very short time they worked out that the bombs would have fallen 350 ft. away from the camera. Not at all bad shooting. If, however, there had been a mistake in reporting the height of the squadron, that would materially alter the result of the calculations.

When "Hart" meets "Hart"

Afterwards I heard the explanation of the "V" formation. The squadron which I had seen rallying to the rear of No. 33 B.S. was No. 23 (Fighter) Squadron from Kenley, which had been attacking No. 33 over Leatherhead. The umpire decided that one bomber was shot down and also one fighter. This was probably the first occasion on which the fighter Hart had been engaged in air combat with the bomber Hart. Squadron Leader Waller, of No. 33, had met the attack of the fighters by changing from squadron formation into squadron V. This formation gives a fine field of fire to the rear gunners. No. 23 F.S. is the composite squadron, having one flight of Hart two-seater fighters and two flights of "Bulldogs." No report has been published as to whether the fighter which was shot down in this fight was a Hart or a Bulldog.

On a Fighter Aerodrome

Wednesday, July 22.—The third day of the exercises was gloriously fine. There were hardly any clouds in the

READY FOR THE NIGHT RAIDERS. The picture at the head of the page shows No. 32 (Fighter) Squadron at Kenley ready to send up patrols of "Bulldogs" to meet the raiding "Virginias" and "Hinaidis." (FLIGHT Photo.)



"SOMEWHERE IN BLUELAND": No. 12 (Bomber) Squadron in readiness at Andover before setting off to raid Redland. (FLIGHT Photo.)

sky, and the few that there were floated about at an enormous height. The day bombers would find no cover from them. Consequently they flew at a very great altitude, where it was extremely difficult to spot them with the naked eye, and even binoculars had difficulty in picking them up and identifying the type of machine.

Anxious to see something of the two-seater fighters, I went to Kenley for the evening operations. The squadrons stationed there are No. 23 (Fighter) Squadron, under Squadron Leader Woollett, D.S.O., M.C., which, as stated above, has two flights of Bulldogs and one of Harts; and No. 32 F.S., under Squadron Leader B. E. Baker, D.S.O., M.C., A.F.C., which is completely equipped with Bulldogs. No. 23 F.S. was the duty squadron for the evening, and the Bulldogs and Hart fighters were drawn up on the aerodrome waiting for orders. A large chunk of the aerodrome was undergoing levelling operations, which rather cramped the style of a squadron about to take off. As zero hour approached, the station klaxons enlivened the afternoon by indulging in a little band practice.

We had not long to wait. The first wave of bombers would doubtless cross the coast at 6 p.m., and the second wave at 6.30 p.m. At seven minutes past six, a Very light was fired, and immediately No. 23 F.S. buzzed with activity. Handles turned in the cockpit set the compressed-air starters working on the Jupiter engines, and they responded promptly. The Kestrels were in motion just as quickly. "A" Flight (the three Harts) taxied out, turned into wind, and took off as speedily as each machine could contrive. The two Bulldog flights followed in the same manner. They took up formation when in the air. I suppose this was due to the levelling operations; but I could not help recalling a raid warning at Kenley in the 1928 Exercises, when the same squadron, then flying "Gamecocks," had taken off by flights, each flight in perfect formation as it left the ground. That certainly looked much better, but I wonder if the take-off individually and the rally in the air saves a trifle of time. It may do so, and, if so, it is an improvement, for seconds may be of importance when Nos. 12 and 33 B.S. are out on the raid.

I had hoped to see a raid come over Kenley aerodrome, or, at least, within sight of it, and be engaged by No. 23 F.S., as I had been lucky enough to see in 1928. This time I was not so lucky, and our defenders vanished from sight into the vast expanse of gleaming blue sky. The official report says that No. 23 F.S. engaged No. 33 B.S. over the Wormwood Scrubbs target, and kept up a running fight for 15 min. A long fight, that, and it is described as a heavy one. Five of the bombers were judged to have been shot down, while the fighters lost four machines. It is very noteworthy that on this raid, No. 33 B.S. had

the better of No. 43 F.S., the only "Fury" squadron. In the neighbourhood of Petworth the raiders passed 10,000 ft. over the heads of the interceptors, who absolutely failed to see them.

The communiqué in question states that No. 33 B.S. came in near Bognor about 6.30 p.m. In that case, No. 23 F.S. had got into the air some 20 min. before this particular raid had crossed the coast. One is set wondering whether information of that raid had been received actually before it crossed the coast (which hardly seems likely), or whether No. 23 F.S. had been ordered up to catch another raid but failed to find it, and spotted No. 33 B.S. more or less by chance. Another possibility is that No. 23 F.S. was sent up on general patrol on the grounds that some raids that evening were sure to cross its sector, and that it was directed by wireless on to No. 33 B.S. when that squadron was reported as having come in. No. 23 returned and landed after having been just an hour in the air.

There was a good deal to interest the privileged spectators during the time of waiting. For one thing, Kenley aerodrome is not at all an unpleasant spot on which to spend a fine summer afternoon, and the mess is a hospitable place where one can retire for periodic refreshment. The booming of invisible engines overhead was almost incessant. Several times we saw formations, sometimes a squadron, sometimes a couple of flights, of Bulldogs flying about over Biggin Hill aerodrome, where we knew that Nos. 3 and 17 (Fighter) Squadrons were living under canvas for the period of the exercises. The communiqué told us afterwards that No. 17 F.S. were after No. 602 (City of Glasgow) (Bomber) Squadron. The Scots Auxiliaries had got up the Thames estuary unperceived, and had dropped a ton of bombs on the R.A.F. Depot at Kidbrooke. Then they were caught by No. 17 F.S., which shot down four of the "Wapitis," with the loss of two Bulldogs.

Presently, in the west, we saw a line of Archie bursts, the white puffs looking very pretty against the azure blue sky. They recalled memories of Ypres in April, 1915, when first I saw those white puffs, and a German aeroplane zig-zagging to escape them. How we of the P.B.I. longed to see a direct hit! But Archie in those days was seldom so lucky. This time the white puffs rather surprised us, for we had been given to understand that anti-aircraft guns were not taking an active part in these exercises, and the final communiqué confirmed this opinion. These little smoke shells were obviously fired well below and to the rear of a bomber formation, but they served to draw our attention to it. Even so, it was with some difficulty that our binoculars picked up the raiders. We hoped that some patrolling fighters would see them too, but they passed

out of our sight without anything of the sort taking place. We could not distinguish the types of machines. Several other raids came into sight during the wait, all of them very high. Once I thought I saw the end of a fight, five machines chasing a squadron, and then leaving it and reforming. I think now that that was our No. 23 F.S. chasing No. 33 B.S., but it was not possible to be certain.

When No. 23 F.S. came in and landed, there was a scene of great bustle while the tanks were filled up again, and one engine received some attention from the fitters. The squadron did not go up again that evening, and as soon as the sun set it was given the order to dismiss, while No. 32 F.S. took its place for night duty. The latter sent up patrols at intervals, and these, as it happened, worked well in conjunction with the patrols sent up by No. 3 F.S. from Biggin Hill. Between them they shot down four "Virginias" of No. 9 B.S. and one "Hinaidi" of No. 10 B.S. The searchlights were busy all the night over the south-eastern corner of England, and a very pretty sight their beams made in the clear summer night.

The raiding and the fighting continued merrily all through the night, and in the early morning of Thursday, July 23. At 9 a.m. the Commander-in-Chief, Air Defence of Great Britain, declared an armistice, and brought the exercises to a close. A week had been allowed for them, in the hopes of getting three fine days. A.D.G.B. is not an optimist as regards British weather. Clouds had been low on the Monday evening, and had caused several raids to turn back, but thereafter the weather had been extraordinarily good for the summer of 1931. So the required tests had been made, and A.D.G.B. was furnished with the information which it required. Therefore a halt was called, and week-end leave became once more a pleasant possibility after a very strenuous time.

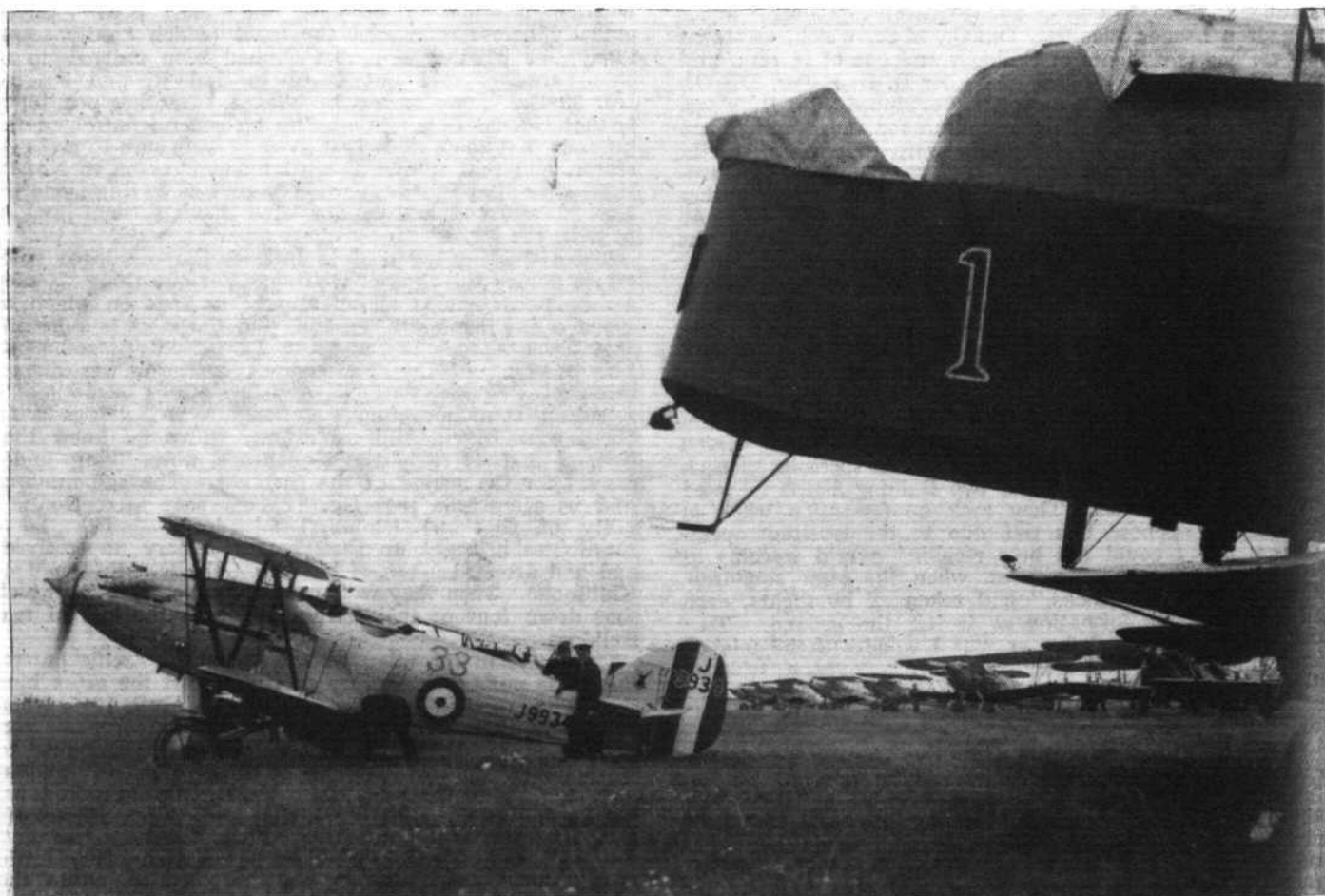
The Lessons

It is always difficult for an onlooker who is not behind the scenes at Uxbridge to assess the lessons to be drawn from any air exercises. A few points are made in the final summary in communiqué No. 10, which is printed below. For one thing, no account was taken of the

possible effects of A.A. artillery fire. Possibly Archie may not make many more direct hits in 1931 than he did in 1915. But he undoubtedly shakes the nerve of raiding pilots. He draws the attention of patrolling fighters to the course of a raid. He tends to break up a formation, for a machine dare not fly straight when under A.A. fire. He is, in fact, a highly useful factor in the defence.

In the second place, no attempt is made to order home a machine which is judged to have been shot down in a fight. One of the objects of the exercises is to give as much practice as possible to all the pilots engaged. The exercises are not like a cricket match, in which it matters which side wins. They are more like batting practice at the nets, where a man does not go out when he is bowled. Consequently, as a sham fight, the exercises are unreal. A squadron is judged to have dropped so many tons of bombs, but no subtraction is made for the number of machines in that squadron which had been judged shot down before the target was reached. In 24 daylight raids by squadrons and 68 raids by single night-bombers, a total of 55½ tons of bombs were supposed to have been dropped. That figure has no value whatever. An estimate of the number of hits on targets would show the merit of the various bombers, but would have no sort of reproach for the defence.

One of the most satisfactory features of the exercises is the work of the Corps of Observers. They did finely, and their reports showed greater accuracy than on the last occasion when the defence of London was tested by air exercises. It is vital that this corps should be at full strength and as efficient as possible, both in the nature of its equipment and in the manner in which the equipment is used. Praise is also given in the summary to the work of the searchlight units of the Territorial Army. On several occasions I noticed the skill with which the beams ringed and caught a night bomber. On one occasion I noticed that the beam could not quite find the Virginia, but the machine was clearly visible from the ground owing to the diffused light from the beams. In a case like that the raider should have been an easy prey to the nearest fighter patrol. When the fighters see the beams concentrating, they go there to have a "look-see," and either



AT ANDOVER: In the foreground stands a "Hyderabad" of No. 503 (County of Lincoln) (Bomber) Squadron, which acted as "Friendly Bombers." In front of it is a reserve machine of No. 33 (Bomber) Squadron; and in the background are the "Harts" of No. 12 (Bomber) Squadron. (FLIGHT Photo.)



"STRAINING AT THE LEASH": The "Bulldogs" and fighter "Harts" of No. 23 (Fighter) Squadron waiting at Kenley for orders to go up and attack raiders. (FLIGHT Photo.)

the diffused light or the glow from the bomber's exhaust usually rewards the search. The bomber is obliged to keep more or less on its course, which handicaps it in a fight, and it may be blinded by the glare of the beams. In a fight by night all the odds should be on the fighter, which makes its attack in the cover of darkness.

The Casualties

The umpires estimated that in all 84 night and day bombers were shot down in air combat, and 69 fighters shared the same fate. These numbers are bound to be very arbitrary, and not much weight should be attached to them. Taking them for what they are worth, they show that out of 112 bombers engaged in the exercises at the start, 84 were destroyed. This is a tremendous percentage in three days of raiding, and it may be taken for certain that no air force in the world could continue to raid in the face of such casualties. We must remember that these casualties were all inflicted by fighters, which only form one of the instruments of defence that would be used in real war. None of the bombers were destroyed on their home aerodromes, which is the most satisfactory way of preserving our property. None was shot down, or worried into a state when it would become an easy victim, by A.A. fire. On the whole, the fighters did very well in their unassisted efforts to defend London.

The first-line strength of the 12 fighter squadrons employed by the defence was 144 machines. Of these, 69 were judged to have been shot down. That is a casualty figure of nearly 50 per cent. of the original strength, and does not, I imagine, include a number of machines which were destroyed in low-bombing raids on aerodromes. Again, no particular significance should be attached to the actual number given. The significant fact is that the umpires, who are presumably authorities on the subject, consider that fighters can seldom or never attack bombers without suffering losses themselves. It was stated at the outset that air attack is a simpler matter than air defence, and this capacity of the bombers to defend themselves in air combat emphasises the point. At one time the opinion prevailed at the Air Ministry that our best defence lay in the aggressive action of our bombers. I do not know if that is still the prevailing opinion with the Air Staff. General Ashmore did not agree with it. At any rate, our bombers, including the Auxiliary squadrons, have shown their ability to fight their way through to their targets, and, on the whole, the average accuracy of the bomb aiming was good. We may feel fairly certain that, if a war broke out in the near future (which Heaven forbid!), our bombers would not have to face any opposition more formidable than that of the Bulldogs. The "Siskins," of course, were outpaced, and on more than one occasion failed to close with raiders which they had sighted. The five Siskin squadrons will soon, we all hope, be re-equipped. On the other hand, in the event of war, our Bulldogs would not have to attack anything so redoubtable as the Harts.

Of the new types employed on these exercises, the Harts (bomber Harts) proved an undoubted success. Their speed and high ceiling proved very valuable assets. One cannot speak with certainty of the fighter Hart, but it seemed to be looked on with favour. Its performance is excellent, and it has the great advantage of affording protection to the tail at the dangerous moment when a fighter zooms after a dive. The general all-round work of the Bulldog by day and night was excellent.

The Interceptors

Great things were expected of the "Fury"—though perhaps it would be more correct to say that the success or otherwise of No. 43 (Fighter) Squadron in these exercises was expected to answer several questions. The interceptors, as a matter of fact, had a very poor bag. Very seldom, if at all, did they intercept a squadron of bombers as it came in. On one occasion, No. 33 B.S. sailed right over the heads of No. 43 F.S. without being sighted. Numerous raids came in very near Tangmere without being troubled by the interceptors. This poor result, so far as I can see, implies no slur on either the squadron or on the Fury aeroplane. The squadron is stationed at Tangmere, practically on the coast. From the first there were speculations as to whether it was correct tactics to place an interceptor squadron on the coast. These exercises seem to have answered the question, and the answer apparently is that the location of the squadron is wrong. An incoming raid usually gets inland out of the reach of the interceptors before the warning can get up to Fighting Area H.Q., and thence back to the aerodrome. The coast aerodromes, Tangmere and Hawkinge, are useful for catching returning raiders making for the coast, but for that purpose standard fighters should be sufficient. The interceptors ought to be further inland. Wonderful as is the climb of the Fury, the squadron needs just a little warning that a raid is approaching to enable it to get to grips with the bombers. To send it up after the raid has passed beyond its reach is a waste of the taxpayers' petrol. I want to make it quite clear that these remarks imply no criticism of No. 43 F.S. It is not a function of a squadron to discover when a raid is coming in, and it does not decide for itself when to take off. It merely obeys orders from the Fighting Area Headquarters.

Looking at the map, one would say that either Biggin Hill or Hornchurch would be the correct tactical position for an interceptor squadron. The Bulldog squadrons at those two aerodromes were constantly in action with the bombers, and did great defensive work. The greater speed and climb of the Fury should have produced still better results.

North Weald and Hawkinge were occupied entirely by "Siskin" squadrons, and there was also a Siskin squadron at Tangmere. Time and again the communiqués commented on the failure of these squadrons to inflict casualties on account of the slowness of their machines. These incidents teach no lessons because the moral had been grasped before. The Siskin, once the best aeroplane of the day, is now out of date. It survives only because of the slow working of the re-equipment programme. As a matter of fact, re-equipment has been proceeding at a very good pace this year; and, whereas last year we had only two squadrons of Bulldogs, now we have six, as well as a squadron of Furies. Our only complaint is that this energy has been tardy in its manifestation. Before the end of the year we hope that the Fighting Area will use nothing slower than the Bulldog. This fighter aeroplane, as stated above, has done excellent work during these exercises. It seems just the right type for use on the two coast aerodromes of Tangmere and Hawkinge, where its function would be to catch raiders on their return journey. Bombers, of course, have an increased performance after they have got rid of their load of bombs; but, on the other hand, the pilots of the bombers will be tired, and possibly somewhat shaken, by the effort of fighting their

way into the target, and should not be in the best fettle for meeting a determined attack by a fresh squadron of fighters. It has been proved during the War that heavy toll taken of bombers on their way home has a very discouraging effect on an enemy. Certainly it is better to intercept them on their way in; but it is the sum total of losses in a short time which convinces the enemy that bombing London is a game which is not worth the candle.

AIR MINISTRY COMMUNIQUE. (6)

Summary of Operations from 18.00 hours, July 21 to 09.00 hours, July 22, 1931.—1. Yesterday the weather was fair generally and visibility was good, but last night the sky became overcast, and this morning the clouds at some places were lower than 2,000 ft. Visibility was good; the wind was light. *First Phase—6.0 p.m. to 9.30 p.m.*

2. At about 6 p.m., two squadrons of BLUELAND day bombers (Nos. 35 and 207) crossed the coast at CLACTON-ON-SEA and made for the WEST INDIA DOCKS. No. 207 (Bomber) Squadron dropped half a ton of bombs in the vicinity of the docks, but after doing so was attacked by REDLAND fighters of No. 54 (Fighter) Squadron over GRAVESEND. Each side lost one aircraft in the combat. No. 35 (Bomber) Squadron reached the objective.

3. No. 12 (Bomber) Squadron belonging to BLUELAND crossed the coast near BOGNOR about 6.15 p.m. and attacked NORTHOLT AERODROME from a low height, dropping two tons of bombs. Immediately after the attack the bombers were intercepted by REDLAND aircraft of No. 19 (Fighter) Squadron, who were, however, unable to inflict any casualties. No. 43 (Fighter) Squadron, one of REDLAND'S fast-climbing interceptor squadrons, left the ground at TANGMERE, but failed to catch the raiders.

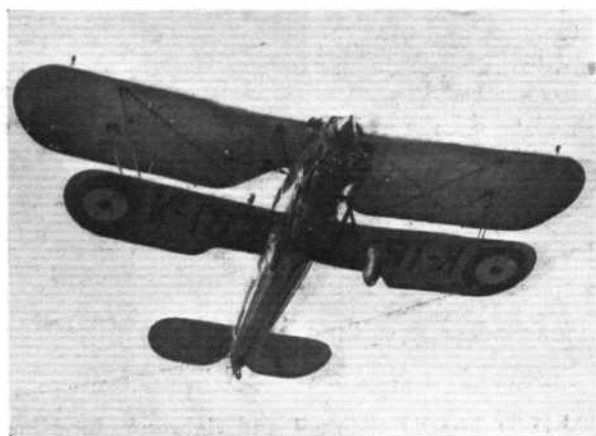
4. Another BLUELAND squadron of fast day bombers (No. 33 (B) Squadron) came in at 6.30 p.m. by way of LITTLEHAMPTON and GUILDFORD. It was attacked near LEATHERHEAD by REDLAND fighters of No. 23 (Fighter) Squadron, who shot down one bomber; one REDLAND fighter was destroyed. The bombers reached their objective, the REDLAND "Seat of Government" at DUKE OF YORK'S HEADQUARTERS, and dropped 1½ tons of bombs on their target with considerable accuracy.

5. Two raiding squadrons of day bombers (Nos. 602 and 604) crossed the coast near BRIGHTON at 7 o'clock. As they approached CROYDON they were attacked by nine REDLAND fighters of No. 3 (Fighter) Squadron, three bombers being destroyed or forced to land. Three REDLAND fighters were shot down and the bombers proceeded to their objective, the WEST INDIA DOCKS, where they dropped 1½ tons of bombs. On the way back to their base, the bombers were again attacked by REDLAND'S aircraft of No. 32 (Fighter) Squadron, and suffered four further casualties. This action cost the fighter squadron the loss of three aircraft.

Second Phase—9.30 p.m., July 21 to 4 a.m., July 22.

6. No. 58 (Bomber) Squadron of BLUELAND night bombers made seven attempts to reach the WEST INDIA DOCKS between 10.15 p.m. and shortly after midnight. Of these, one forced-landed before crossing the coastline, and would in reality have been lost in the sea; actually it landed at MANSTON. Three bombers were attacked on the way in, and of these two were shot down by four aircraft of No. 3 (Fighter) Squadron and by aircraft of No. 32 (Fighter) Squadron near BIGGIN HILL and SEVENOAKS, respectively. The third was attacked by one aircraft of No. 54 (Fighter) Squadron, reached the vicinity of the target, but failed to identify it accurately, dropping half a ton of bombs in the vicinity of the DOCKS. Two raiders reached the objective, bombed accurately, and dropped between them 1½ tons of bombs. Of these, one was engaged by one aircraft of No. 54 (Fighter) Squadron, and the second by one aircraft of No. 32 (Fighter) Squadron, neither being damaged. The seventh raider failed to approach the objective.

7. A BLUELAND night bomber squadron (No. 99) made six raids by single aircraft on the imaginary DOCKS at HACKNEY MARSHES. Four were attacked on their way in, and one on the way out. Of these, the umpires assessed that one was shot down. Three aircraft failed to identify their target, and of the remaining three one bombed accurately, the other two having errors of 500 and 1,000 yards. A ton of high explosive and 3 cwt. of incendiary bombs were dropped.



"LET ME GET AT THEM": A "Bulldog" of No. 23 (F.) Squadron off on receipt of a raid warning.
(Flight Photo.)

8. No. 10 (Bomber) Squadron made five single raids against the REDLAND "Seat of Government," DUKE OF YORK'S HEADQUARTERS, between 10.15 p.m. and 10.35 p.m., and five against the "ASSOCIATED AIRCRAFT WORKS" at WORMWOOD SCRUBBS between 12.15 a.m. and 2.15 a.m. All raids crossed the coast near SHOREHAM and none was intercepted, all five bombers reaching the REDLAND Headquarters, on or near which over 2 tons of bombs were dropped. Only three of the five reached the "ASSOCIATED AIRCRAFT WORKS." These three dropped 2 tons of high-explosive bombs, together with 3 cwt. of incendiary bombs on the works.

9. No. 9 (Bomber) Squadron (BLUELAND) carried out nine raids by single aircraft, six on the "ASSOCIATED AIRCRAFT WORKS" at WORMWOOD SCRUBBS between 10.15 p.m. and 1.45 a.m., and three on the Headquarters of the REDLAND Government between 10.45 and 11.45 p.m. The coast was crossed either at RYE or BRIGHTON.

Of the raids on WORMWOOD SCRUBBS, two were not intercepted. Of the remaining four, two were attacked on the way in by REDLAND aircraft of No. 32 (Fighter) Squadron, and over

the targets by an unidentified fighter. One bomber and one fighter were destroyed in these combats. The remaining bomber was attacked on the return journey, both bomber and fighter being shot down. The weight of bombs dropped on WORMWOOD SCRUBBS was 2½ tons of high-explosive, and 3 cwt. of incendiary bombs.

Of the bombers which attacked the REDLAND Headquarters, one forced-landed at KENLEY and the aircraft was lost, the pilot's maps falling into enemy hands. Another was attacked on the inward journey by an aircraft of No. 32 (Fighter) Squadron, and did not reach the objective. A third bombed the Headquarters, but bombing accuracy is doubtful. On the return journey it was attacked by two REDLAND aircraft, and all three aircraft were shot down. The total weight of bombs dropped on REDLAND Headquarters was half a ton.

Third Phase—4 a.m. to 9 a.m., July 22.

10. Nine fast BLUELAND aircraft of No. 33 (Bomber) Squadron crossed the coast at SELSEY at 5.30 a.m. to attack NORTHOLT aerodrome. Over the objective an attempted attack on the bombers was made by nine aircraft of No. 19 (Fighter) Squadron. This attack was ineffective as the Fighters were unable to close. One fighter was shot down by the bombers as it was leaving the ground, and one bomber was hit by aerodrome ground defences and forced to land. Two tons of bombs were dropped.

11. The other fast BLUELAND bomber Squadron (No. 12) also crossed the coast at SELSEY, and at 7.15 a.m. attacked NORTHOLT aerodrome. They were not intercepted on their way in, but were attacked over the aerodrome by nine aircraft of No. 19 (Fighter) Squadron. In the course of the fighting, one bomber was destroyed, and one forced to land, while two fighters were destroyed. One and a-half tons of bombs were dropped.

12. During the period 6 p.m., July 21, to 9 a.m., July 22, six raids were attempted by day bombers; all six of these were engaged on their way in or their way out, but owing to low speeds of some of the fighters compared to the bombers engaged, not all of these attacks were able to inflict casualties.

In all, 31 attacks were made after dark by night bombers; of these, 16 were attacked by REDLAND fighters either on their way in or their way out.

13. In order to test the extent to which the defence is liable to confusion, owing to the fact that our own bombers may be passing over the defended area at the same time as the enemy, certain squadrons and flights have represented friendly bombers, on their way out to or on their return from imaginary objectives outside ENGLAND.

The following raids were represented through the observer area:—

No. 26 (Army Co-operation) Squadron provided six aircraft to represent day raids returning. Three aircraft flew from LYPNE to ALTON, representing a raid returning to NETHERAVON, and a further three from MANSTON to GREAT DUNMOW representing a raid returning to BICESTER. No. 463 (Torpedo Bomber) Flight with a formation of five aircraft, flew from TANGMERE to ODIHAM, representing a raid returning by day to BICESTER. By night two aircraft of No. 502 (Ulster) (Bomber) Squadron flew courses from SUDBURY to MANSTON representing outgoing raids from BIRCHAM NEWTON. No. 503 (County of Lincoln) (Bomber) Squadron represented three night raids from WORTHY DOWN, going out via Hove, and a further three passing out over WORTHING; they also represented raids returning to WORTHY DOWN by two aircraft from WORTHING and one from HOVE.



AFTER THE FIGHT: Refilling the tanks of the fighter "Harts" of No. 23 (F.) Squadron after a 15 minutes combat with No. 33 (B.) Squadron. (Flight Photo.)

14. The Observer Corps was continually on duty from 6 p.m. on the 21st to 4 a.m. on July 22, 1931. The accuracy of their reports was of a high standard, and showed a considerable improvement on those made in the previous year.

Nos. 7, 8 and 9 were interim reports and are covered by No. 10.

(10)

Summary of Operations from 6 p.m., July 22, to 9 a.m., July 23, 1931.—1. Fine weather prevailed throughout, and visibility was good, but small patches of low, drifting clouds crossed the operational area.

First Phase—6 p.m. to 9.30 p.m., July 22.

2. No. 12 (Bomber) Squadron crossed the coast near SHOREHAM at about 6 p.m., their objective being BECKTON PETROL DUMP. They reached the vicinity of their target without interception, but being unable to find the target, they dropped 2 tons of bombs on the Docks nearby. On the return journey they were attacked by No. 111 (Fighter) Squadron. Four fighters and five bombers were destroyed.

3. No. 602 Auxiliary Air Force Squadron came up the Thames Estuary at about 6 p.m. and made for the Aircraft Depot at KIDBROOKE. They were not intercepted, and dropped 1 ton of bombs with good effect. Immediately afterwards they were attacked by fighters of No. 17 Squadron, the engagement lasting 5 minutes. Four bombers and two fighters were shot down.

4. No. 207 (Bomber) Squadron flew in over CHELMSFORD at about 6 p.m., their objective being the WEST INDIA DOCKS, which they reached without interception. One ton of bombs was dropped with accuracy, but on the return journey they were attacked over SHELHAVEN by No. 111 (Fighter) Squadron, and one bomber was destroyed.

5. No. 33 (Bomber) Squadron came in by way of LITTLEHAMPTON at 6.30 p.m., and made for the "ASSOCIATED AIRCRAFT WORKS" at WORMWOOD SCRUBBS. When in the neighbourhood of PETWORTH it passed 10,000 ft. above the interceptor fighter squadron from TANGMERE, which failed to see or intercept them. They were heavily attacked over their target by single-seater and two-seater fighters of No. 23 Squadron. A running fight ensued, which lasted for 15 minutes. Four fighters and five bombers were destroyed, and the raiders flew wide of their target.

6. No. 35 (Bomber) Squadron also attacked the WEST INDIA DOCKS, approaching from the CHELMSFORD direction. They were intercepted on their inward journey by No. 111 (Fighter) Squadron at ROMFORD. The Umpire adjudged four bombers and three fighters to have been shot down. The remaining bombers were again attacked over the objective by the interceptor fighters of No. 43 Squadron. One fighter and three bombers were destroyed in this engagement. Half a ton of high explosive and $\frac{1}{2}$ cwt. of incendiary bombs were dropped on the DOCKS, but the remaining two bombers were again engaged near CHELMSFORD by six fighters of No. 29 Squadron, and both were shot down. One fighter was forced to land.

7. No. 604 Auxiliary Air Force Squadron attacked the Headquarters of the REDLAND Government at "The Duke of York's" Headquarters. They crossed the coast over BEXHILL at about 7 p.m. and dropped 1 ton of bombs from a height of 16,000 ft. They were not intercepted on the way in or out, but their bombing was inaccurate.

Second phase—9.30 p.m., July 22 to 4 a.m., July 23.

8. Seven night bombers of No. 58 Squadron crossed the coast in succession, between LITTLESTONE and BEACHY HEAD, from 22.15 hours to 23.15 hours, to attack the AIRCRAFT DEPOT, KIDBROOKE. Five of these aircraft were intercepted on the inward journey by Nos. 3 and 32 Squadrons, and three were destroyed before reaching their objective. The other four bombers reached the target, but all the bombing was inaccurate. One aircraft was attacked again on the outward journey by a fighter of No. 3 Squadron. The weight of bombs dropped was $3\frac{1}{2}$ tons of high explosive, and 4 cwt. of incendiary. In all, three bombers and three fighters were shot down.

9. From 22.15 hours onwards, seven bombers of No. 99 Squadron crossed the coast between ORFORDNESS and FOULNESS POINT, their objective being the WEST INDIA DOCKS. Five of these were intercepted by patrols of Nos. 54 and 56 (Fighter) Squadrons; one bomber was destroyed on the inward journey, and two or the way out. Three fighters were also shot down. Three bombers reached the target and did accurate bombing. The total weight of bombs dropped was $2\frac{1}{2}$ tons of high explosive and 6 cwt. of incendiary.

10. No. 9 (Bomber) Squadron made individual raids on the "Associated Aircraft Works" at WORMWOOD SCRUBBS. They crossed the coast near Ovingdean and carried out their attacks between 00.50 hours and 02.30 hours. Of the seven raiders, four failed to reach the objective, and were shot down by the fighters of Nos. 32 and 3 Squadrons, the latter squadron also losing one aircraft. The other three bombers reached the objective and bombed it accurately. One of these was attacked on its way out, but was not brought down. The weight of bombs dropped was 2 tons.

11. Eight night bombers of No. 10 Squadron set out to cross the coast near HASTINGS, their objective being WORMWOOD SCRUBBS. They crossed the coast singly from 23.30 hours onwards; one was compelled to return on account of weather, and one on account of engine trouble. Of the remaining six, four were intercepted on the inward journey by patrols of Nos. 32 and 3 (Fighter) Squadrons, and one fighter and one bomber were shot down. Four aircraft reached the objective and bombed accurately. The fifth failed to locate the target. The total weight of bombs dropped was two tons of high explosive and 4 cwt. of incendiary.

Third Phase—4 a.m. to 9 a.m., July 23.

12. No. 12 (Bomber) Squadron crossed the coast near SELSEY BILL at about 6 a.m., their objective being the WEST INDIA DOCKS. They were intercepted on their way in over HORSHAM by one interceptor fighter of No. 43 Squadron, and over KENLEY by six single-seater fighters and two two-seater fighters of No. 23 Squadron, who sustained their attack until the bombers were over their objective. In these combats three fighters of No. 23 Squadron and four bombers of No. 12 Squadron were shot down. The remaining five bombers reached their objective at 6.30 a.m. and dropped their bombs accurately from a height of 4,800 ft. The raid was not intercepted on the return journey. Weight of bombs dropped—1 ton.



"A RAID IN OUR SECTOR": Pilots of No. 23 (F.) Squadron mount, on receipt of orders from Fighting Area Headquarters. (Flight Photo.)

13. No. 33 (Bomber) Squadron, also crossed the coast near SELSEY BILL at about 6 a.m. to bomb the WEST INDIA DOCKS. They reached their objective, and bombed the target from 1,520 ft. The accuracy of the bombing could not be assessed owing to a thin layer of cloud hiding the aircraft. The raid was not intercepted on either the inward or outward flights. Weight of bombs dropped, 2 tons.

14. No. 207 (Bomber) Squadron followed by No. 35 (Bomber) Squadron approached London up the THAMES at about 6.30 a.m. They were attacked by three fighters of No. 25 Squadron. Both squadrons were also attacked by No. 111 (Fighter) Squadron between HORNCHURCH and DAGENHAM. Five bombers and five fighters were shot down. The remaining bombers reached their objective, the WEST INDIA DOCKS, where No. 207 Squadron dropped their bombs with fair accuracy, while No. 35 Squadron missed the target. On the outward journey, No. 207 Squadron was attacked, at about 7 a.m. over HORNCHURCH, by nine fighters of No. 29 Squadron, two bombers being shot down. Three-quarters of a ton of high-explosive bombs were dropped, and 5 cwt. of incendiary.

15. No. 602 and 604 Auxiliary Air Force Squadrons crossed the coast near BRIGHTON at about 8 a.m., flying north. They were attacked in the neighbourhood of KENLEY by six single-seater and three two-seater fighters of No. 23 Squadron. A running fight occurred until the bombers reached their objective, the WEST INDIA DOCKS. In this engagement the casualties were two single-seater and two-seater fighters, and four bombers. No. 602 Squadron was again attacked on its outward journey near CHATHAM by five interceptor fighters of No. 43 Squadron. One bomber and two interceptor fighters were shot down. A further attack was made on the remaining bombers by three fighters of No. 25 Squadron, but no casualties resulted. One and a-half tons of high explosive were dropped on the target with fair accuracy.

16. *Redland Bombers.*—Counter-bombing raids by REDLAND were again made during the period under review. No. 26 Squadron supplied two flights of three aircraft to represent day raids returning. One flight flew from MANSTON to DUNMOW, representing a raid returning to BICESTER, and the other from LYPNÉ to ALTON, representing a returning raid through the observer area to NETHERAVON. No. 463 Flight flew a course from TANGMERE to ANDOVER to represent a day raid returning to NETHERAVON. By night No. 502 Squadron represented an outgoing raid from BIRCHAM NEWTON by flying a course from SUDBURY to MANSTON. No. 503 Squadron provided three night bombers, and represented two outgoing raids from WORTHY DOWN via HOVE or WORTHING.

Final Summary.

17. In exercises such as these it is not possible to assess the effect of fights at the time they take place, and so prevent raids which might have been driven off from reaching their objectives. Nor would it be desirable to do this, even if possible, since such action would deprive the bombing formations from gaining experience of bombing targets at the end of long flights.

Further, it is not possible to say whether or no the effect of the fights would cause the bombing pilots to abandon their tasks. Consequently, it must not be assumed that all the bombers which do in fact reach their target would have done so in reality.

Finally, it is to be remembered that the A.A. Artillery has not taken part in this exercise, and so the effect of their fire had not been considered.

18. During the period of the exercise—6 p.m., July 20, to 9 a.m., July 23, 24 raids by day bombers penetrated the London defences; some of these were made by two squadrons in company. Twenty of these raids were intercepted on the way in or out.

Sixty-eight raids by single night bombers also penetrated the defences in the London area during the same period. Of these, 39 were intercepted by the fighters of the defences.

A total of 54 tons of high-explosive bombs and $1\frac{1}{2}$ tons of incendiary bombs were dropped.

In all 84 BLUELAND bombers and 69 REDLAND fighters were destroyed in air combat.

Due to the continued fair weather during the first three days of the exercises, sufficient information was obtained to assess the operational efficiency of the Units taking part, and the A.O.C.-in-C. accordingly concluded the operations at 09.00 hours on July 23, 1931.

The greatest credit is due to the Observer Corps, to the Territorial Army Units, Auxiliary Air Force and Cadre Squadrons for their efficiency and enthusiasm, which contributed in a large degree to the success of the exercises.



PRIVATE FLYING AND CLUB NEWS



AN AERIAL ASCOT

The Household Brigade Flying Club meeting held at Heston Air Park last Wednesday bids fair to become the chief social event of the season in the flying world.

WEDNESDAY last, July 22, presented a very animated spectacle to those who were fortunate enough to be invited to Heston. It was not a public function, in fact the general public were definitely discouraged by the aerodrome being advertised as being closed (whatever that may mean), but the number of visitors was quite large enough to make the show more than a success.

Messrs. Norman and Muntz must, figuratively speaking, have rubbed their hands with glee when they saw so many of just the sort of people they set out to cater for gathered together on their aerodrome. Airwork, Ltd., have always made it their policy to encourage the people who consider themselves well up the social scale and who can afford more or less what they want in the way of aircraft, and by holding such functions as a meeting of the Household Brigade Flying Club at Heston large numbers of these are attracted and interested, with the eventual result, we hope, of their learning to fly and purchasing aircraft of their own. On this occasion the presence of H.R.H. The Prince of Wales set the seal of social success on the meeting, and we are all very grateful to him for coming. Just what it can have meant to him few will realise, but in view of the fact that during the morning of the same day he opened the Royal Welsh Agricultural Show at Llanelli, and that he flew from there to Heston in order to be present at this meeting, it will be seen that the debt of gratitude owed him for his part in furthering the cause of flying is very large indeed. The Prince of Wales with his characteristic thoroughness has not used aircraft to make his hard days easier, but has done so in order that he may cram still more public service into each twenty-four hours, and the way in which he does so should make any sceptic ashamed of his doubts as to the utility of aircraft, and will also make most men wonder what they were talking about when they averred that they were so busy that they couldn't find time for this or that.

The Household Brigade Club would naturally collect unto themselves a galaxy of beauty on such an occasion, and on our arrival we expected to see not only the latest fashions but also the right people wearing them; what we did not anticipate was that we should see so many of the latest fashions or so much beauty. Bowler hats seem to have become the correct wear for male or female, and all shapes and sizes were to be seen. Personally we feel that those ladies who affected large brimmed hats gained the most comfort from the shade afforded, particularly when they gazed at the aircraft in the sky, but there is no denying that the bowler type is very attractive—husbands had better pawn theirs quickly until the fashion has passed if they want to retain them for themselves!

On the Prince of Wales' arrival, together with his equerry, in two Puss Moths, he was received by the President of the Club, Major-General C. E. Corkran, C.B., C.M.G., and at once evinced interest in the wide range of aircraft which had gathered at the meeting. It certainly was a representative gathering, and we do not remember ever having seen so many types together before. In all there was a total of over 80 aircraft spread about the aerodrome, with specimens of the Moth, Avian, D.H.9J., Puss Moth, Wessex, Ford, Reid-Rambler, Arrow Active, Sikorsky, Avro 6, Klemm, Breda, Woodpigeon, Spartan Arrow, Autogiro, Bluebird, Civilian Coupé, Widgeon, Swift, Avro Tutor, Redwing, Martlet, Desoutter, Monospar, Lincock, Windhover, Aeronca, while during the afternoon the Fairey Long Range machine flew over repeatedly and let us see her graceful lines, and Hadrian,

built, as the poultry fancier would say, "for utility more than for show," and consequently, not quite so graceful, also heaved his bulk around and blotted out the sun. With regard to his activities we understand that he did sterling work on that day, as he was one of the fleet of aircraft to denude the British banks of somewhere about 25 tons of gold and to transfer it to France and Germany.

The programme was rearranged from the published form, so people had to rely on the announcer for their knowledge of what was happening. This is really as it should always be, and we cannot help wondering why some people will continue to issue programmes for flying meetings which give a list of events and even the times at which they are supposed to start. By far the better way is just to give a list of events without any times, and then to let the announcer do the rest.

The first item was the preliminary flights in the final of the "Gwynn Madocks" Cup. This is a landing competition held annually by the Household Brigade Club, in which the competitors have to land as near the centre of the circle on the aerodrome as they can, from a height of 500 ft., without using their engine. The member obtaining the most marks in three attempts being the winner. The final flight was the last item on the programme, and resulted in a win for Capt. J. Harrison with 155 marks, Mr. L. Grey Sykes being second with 104, and Capt. J. Hargreaves third with 52 marks. At the end of the programme the Prince of Wales graciously presented the cup to the winner.

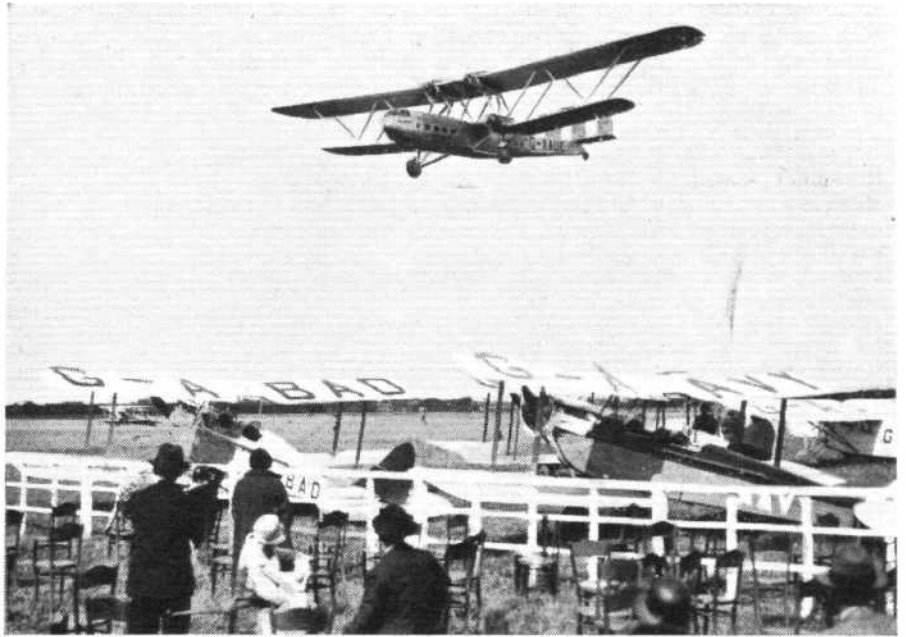
Flt. Lt. Rawson then showed off the Autogiro,



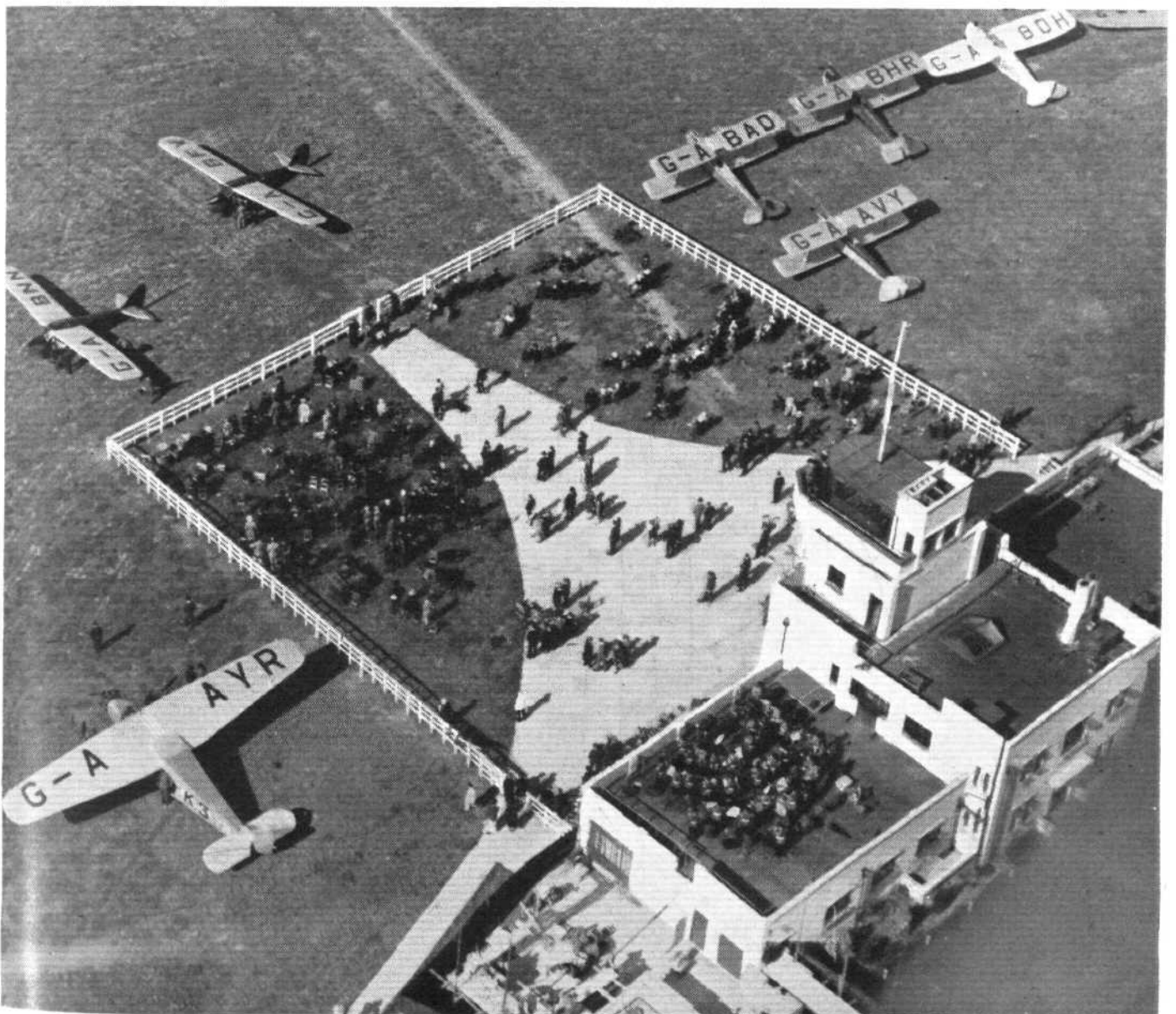
H.R.H. The Prince of Wales showed great interest in the 3-engined Ford and is here seen emerging after having looked over it, together with Capt. Baker the Chief Instructor at Heston.

demonstrating the way in which it can be landed almost vertically, and he was followed by Flt. Lt. Stainforth on an Avian. Stainforth's aerobatics are now well known, and the steady way in which he rolls, loops and bunts is an education for the less experienced pilots who think that looping consists of pulling the stick back hard and hoping for the best. Following this came the Spartan Arrow flown by Col. Strange. The Arrow, as flown by Col. Strange, has become known as the slowest flying English light aircraft; by that we do not mean that it does not go fast as well, but that it is perfectly controllable at a lower speed than most others.

F./O. McKenna put up a very fine show on the Lincock; this machine was fitted for inverted flying, and he was therefore able to do such things as vertically banked turns when upside down, which are naturally impressive. He showed that he has learnt the art of showmanship as well as of aerobatics, as his manoeuvres were all well out over the aerodrome and sufficiently high to be safe, and yet not so



"Hadrian" has a look at the meeting.



An Aerial view taken just as the Prince of Wales stepped out of his Puss Moth. His second machine brought one of his equerries. The Band of H.M. Grenadier Guards can be seen on the roof of the Club House.

high as to be hard on one's neck when looking at him. Later on demonstrations were given of the Monospar machine by Flt. Lt. Schofield, of the Windhover by Mr. S. D. Scott, of the Sikorsky by Maj. Clarke, and of the Aeronca by Flt. Lt. C. Clarkson.

There was also a crazy flying show by Capt. Baker, the chief instructor at Heston. Capt. Baker threw a Moth about in a way that certainly showed his control over it, and seemed to attract the crowd, who ceased their social small-talk and flocked to the rails, a recently added sort of paddock effect in front of the main buildings and offices, to see him.

Following this came the Ford monoplane, which seemed to delight in "shooting up the aerodrome" and roaring round in such a way that its noise made one look at it. The Prince of Wales showed quite a lot of interest in it, and examined the cabin at least once if not on more occasions.

After this the flying part of the meeting finished, and those present devoted themselves entirely to enjoying each other's company.

The aircraft control was, of course, under the able management of Mr. Jeffs, and only two incidents marred the afternoon from his point of view, one was when the pilot flying the Lincock took off before he was given the signal to do so, and was in consequence right across another machine which was flying at the time, and the other was after the meeting was more or less finished,

when the Desoutter took off and the pilot turned it right across the aerodrome long before he reached the edge. Both these were avoidable and entirely unnecessary examples of bad and dangerous flying, which was unfortunate as so far this year we have kept these meetings singularly free from pilots who do this sort of thing; however, no doubt they have been told what the officials thought of it, and will see to it that they do not offend again.

Several of our well-known aircraft designers and managing directors of aircraft firms were present, and one of these should, we think, receive some special recognition for his recent display of stoicism. It occurred not long ago that he was attending a very important dinner, and had left it until late before changing, so that when doing so was in a great hurry. We can imagine his feelings, therefore, when he discovered that his bag had been packed with two left shoes instead of a right and a left! Was he dismayed? No, not a wit; and in spite of the massiveness of his pedal extremities he donned the shoes and wore them throughout the dinner as a normal pair . . . at least so we are told!

The trade element was in good attendance, as there were representatives of the Ford Co. with their large monoplane; of Personal Flying Services, whose Sikorsky was being flown by Major Clarke, and of the many firms and aircraft agencies with offices of their own at Heston.

BROOKLANDS.—The Brooklands School of Aviation managed to put in a total flying time of 57 hr. during the week, which, in view of the exceptionally bad weather, seems very good; on Sunday alone, for instance, 17 hr. instructional flying was done. During the week Messrs. Eyles and Slaughter made their first solo flights and Mr. Wynne Eyton completed the tests for his "A" licence. Mr. Parker, the sales manager, has been exceptionally busy, having made visits to Paris, Glasgow, Manchester, Liverpool, Ipswich and Norwich.

THE HUSBAND BOSWORTH MEETING.—The flying meeting at Cotehill, near Rugby, on Sunday, July 26, was very well supported by both visiting pilots and the public. Some 35 machines were present, including Puss Moths, Moths, Avians, the Comper Swift and the Blackburn Lincock. The first item on the programme was an exhibition of formation flying by members of the Leicestershire Aero Club, followed by a demonstration of aerobatics by F./O. McKenna on the Blackburn Lincock, with a further demonstration of inverted flying by Mr. Clarkson, of Selfridge's. The next item was a race from Cotehill to Desford and back, and was won by Mr. Jackaman on a Puss Moth. Capt. Stewart did his usual parachute drop, but, unfortunately, the wind was not quite as strong as it appeared, and he made a landing in a field adjacent to the aerodrome. The final item was a car-bombing competition, which was won by Mr. Tommy Rose on the Pratts Avian. The whole meeting was very well organised and a most enjoyable occasion, but towards the end it started to rain, and out of some 18 machines which left for London, only four arrived, most of the others landing just on the south side of the Chilterns. The only

people to get through to London that day were Flt.-Lt. Armour, Mr. Clarkson and Mr. McClure.

CINQUE PORTS FLYING CLUB.—In spite of adverse weather conditions during the week ending July 26, the flying time reached 27 hrs. 10 mins., which speaks well for the enthusiasm of members. The Club's Cross-channel scheme is working well, and would no doubt have been more used had the weather been better; Mr. Fisher flew to St. Inglevert on Thursday, and flights by members to Le Touquet (Friday, Saturday) had to be abandoned.

On Thursday they were glad to welcome four Swiss aviators on Lympe aerodrome, who had been collecting Moths at de Havillands. Several new members commenced instruction during the week, and a crop of "A" licences is expected shortly. Lieutenant-Commander Gubbins, R.N., and Mr. Morris flew to Paris on Saturday, but were unable to return on Sunday as they had hoped owing to low clouds and bad visibility.

The Bomb Dropping Competition was duly held on Sunday as arranged, and resulted in a win for Mr. P. W. Marriage, whose nearest bomb was 19 ft. from the mark.

Mr. Pennington has arranged to give an exhibition of night flying with flares on the night of the Club dance at Lympe, and this will no doubt prove a popular event.

The monthly Ashwell-Cooke Landing Competition, due to take place on Sunday, August 2, has been postponed until Sunday, August 9, when it is expected that there will be a great many more entrants.

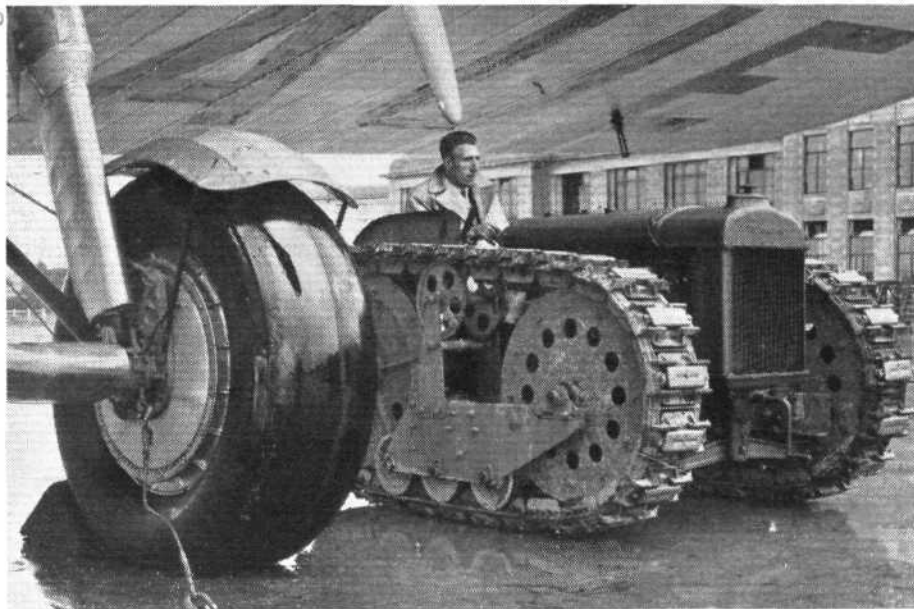
A large gathering of members and others is expected at the coming week-end, as several formations have been arranged for those attending the meeting at Deauville.



An all-Australian light aircraft which has been designed, constructed, and flown by Mr. Staig, an amateur pilot of the Victoria Aero Club, at Essendon. The engine, which is not unlike Cirrus Mark I, has been designated "Cirrus Staig"—Mr. Staig having himself made pistons, cylinders, tappets and tappet rods. The 31-gallon tank capacity will give it a flying range of approximately 400 miles.

AIRPORT NEWS

CROYDON



JACK-THE-GIANT HAULER: This is the Fordson caterpillar tractor, referred to in last week's notes, now used at Croydon for hauling the giant airliners about.

WHATEVER the effect of the removal of gold from England to foreign Powers on the country as a whole, it has certainly given the airlines great business carrying it. The past week must have easily broken all records for traffic. It has been one continuous stream of machines all day to and from abroad, and on two days running nearly 100 aircraft arrived and departed from here. One can well imagine the hard work this has entailed all round. The Air Ministry Control Officers have had as many as 20 machines in the air at a time, and, as the weather on several occasions has been far from good, nobody has envied them their lot. However, everything has operated like clockwork; it has been a credit all round, and a wonderful advertisement for aviation.

On Monday, while the London-Antwerp Fokker of the Sabena Air Lines was flying over Belgium, one of its engines dropped out. Luckily, it fell in a field, and no damage was done, and the pilot proceeded to Brussels, minus one engine. This is the second time this has occurred, and one imagines that there must be some weakness in the structure. It is to be hoped this company will endeavour to right this matter before it occurs again, and falls on a more crowded spot than a field.

Redwing Aircraft are very busy training pilots for the London General Omnibus Company's new light aeroplane

club. This club, I understand, is proving an amazing success, and several more Redwings are likely to be acquired before long.

On Tuesday, Mr. Kaye Don arrived from abroad, and was met by his chauffeur with his Burney streamlined car, the object of much admiration by all who saw it. Although only 20 h.p., it is capable of a speed of 90 m.p.h.

Hannibal and Hadrian have now got into their regular stride, for they are both operating a very trouble-free service. The old Westland IV of Imperial Airways has returned here in the shape of a Wessex, and is fitted now with Genet Major engines. The performance in consequence has been greatly improved, and this machine should now be more useful than in the past, for special charter work. The joyriding was marred over the week-end by the ghastly weather, and all concerned are hoping for a fine spell over the August Bank holiday, it being the last holiday of the year. A really good week-end, then, will help matters considerably.

Miss Muntz has been over to Croydon to do her cross-country flights for "B" licence. During the last few weeks there has been a large number of "A" licence pilots taking their "B" licence.

The traffic figures for the week were:—Passengers, 1,510; freight, 135 tons. P. B.

Dunlop Tyres Not Guilty

FROM the Dunlop Company we learn that, after all, it was not a Dunlop tyre that caused the delay when Hannibal "blocked the way" of other machines in the hangar at Le Bourget recently. In fact the Dunlop wheel "is giving complete satisfaction and the original wheel is still in use," as testified by Imperial Airways, Ltd.

A Platform Aerodrome for Paris

THE problem of an aerodrome within, or closer to, the Metropolis is evidently receiving attention in Paris as well as in London—for example, the proposed aerodrome over King's Cross railway station—for it is reported that a scheme has been put forward for a new elevated airport at Issy les Moulineaux, where the early pioneer flights of Blériot, Farman and Latham were accomplished. It is suggested that the parade ground at Issy, just beyond

the Porte de Versailles and on the river bank, might be transformed into an ideal airport, by constructing a vast flying "ground" at a height of several storeys from the ground. This ground would, in fact, be the roof of a great block of warehouses, offices, and hangars for private and commercial machines. It would have an area of about 140 acres. Seaplanes could use the river in front of it as a port.

Deauville Aerodrome

A NEW aerodrome was opened at St. Gratien, Deauville, on July 26. The occasion was chosen by the Aéro Club de France for its annual rally, which was attended by a large number of civilian and military airmen and patronised by the Minister of Air, M. Dumesnil.

AIRISMS FROM THE FOUR WINDS



The Farman 190 (240 h.p. Lorraine) on which M. D'Estailleur Chauteraïne made a Flight Round Africa.

Miss Amy Johnson's New Venture

On July 28, at 1.27 a.m., Miss Amy Johnson left Lympne Aerodrome on the first stage of a flight to Tokio, which she hopes to reach in seven days, via Berlin, Warsaw, Moscow, Siberia and Manchuria. She was flying her "Puss Moth" *Jason II*, and was accompanied by Mr. C. Humphreys—formerly a Ground Engineer at Stag Lane aerodrome. Berlin was reached the same morning, and they then flew on, with a stop at Koenigsberg, to Moscow, which was reached at 10.35 p.m.

More Atlantic Flights

Two more Atlantic flights are in progress. On July 28 Mr. John Polando and Mr. Russell Boardman left Floyd Bennett Field, New York, in their Bellanca monoplane, *Cap Cod* (300 h.p. Wright engine), intending to fly non-stop to Constantinople. They started at 11 a.m. British Summer Time, and were sighted off Newfoundland 9.6 p.m. B.S.T. Twenty minutes after these two had left New York, Mr. Hugh Herndon and Mr. Clyde Panghorn left the same aerodrome in another Bellanca (425 h.p. Wasp engine), hoping to fly non-stop to Moscow as a first hop of a round-the-world trip which they hope to accomplish in six days, thus beating the Post-Gatty record by three days. They were sighted off Newfoundland 9.25 p.m., British Summer Time.

European Pilots for U.S. National Air Races

LIEUT. A. J. WILLIAMS, the American pilot, recently visited Europe to secure pilots to take part in the U.S. National Air Races, which are being held at Cleveland, Ohio, August 29—September 7. He has since returned to America with the following selections: Great Britain, Flight-Lieutenant Atcherley (who took part in the 1929 Schneider Trophy); Germany, Ernest Udet; Italy, Major de Bernardi, and Poland, Capt. Corlinski.

Sir Alan Cobham's Progress

SIR ALAN COBHAM, who left Rochester on July 23 in the Short "Valette" seaplane on a survey flight to Central Africa, reached Marseilles the same afternoon. He then flew on to Tunis, whence he proceeded to Malta, arriving there on July 25. Next day he flew to Corfu and thence to Alexandria.

The French Flight Round Africa

WE have received some further particulars of the recent flight round Africa carried out by M. D'Estailleur Chauteraïne, president of the committee of L'Entente Française. He left Paris, in a Farman F.190 monoplane (240-h.p. Lorraine), piloted by M. F. Giraud, and with M. Mistrot as mechanic, on April 8, and arrived back on July 17. The following is a log of the flight:—April 8, Alicante; April 9, Rabat; April 10, Agadir; April 11, Port Etienne; April 12, Dakar; April 14, Konakri; April 15, Kankan; April 16, Bingerville; April 17, Grand Bassam; April 19, Accra, Kotonou; April 20, Douala; April 23, Libreville; April 24, Brazzaville; April 25, Leopoldville; June 13, Loanda; June 14, Mossamedes; June 15, Walfish Bay, Capetown; June 20, Port Elizabeth; June 23,

Durban; June 24, Lourenco Marques, Inhambane; June 25, Qulimane; June 26, Zanzibar; June 28, Mogdishu; June 29, Obbia; July 2, Berbera; July 3, Jibouti; July 5, Port Sudan; July 6, Wadi Halfa; July 7, Aswan, Cairo; July 10, Dorna; July 11, Bengazi; July 13, Tripoli, Tunis; July 14, Oran; July 15, Tangier; July 17, Paris. The whole flight, lasting 3½ months, was carried out without incident, other than a landing accident near Leopoldville.

"Graf Zeppelin's" Arctic Voyage

THE airship *Graf Zeppelin* left Friedrichshafen on July 24 on a voyage of exploration in the Arctic. Dr. Eckener was in command, and there were on board a crew of 30 and 16 passengers, scientists and journalists. She arrived at Staaken the same day and moored. On 25th she proceeded to Leningrad, which she left on the 26th at 11.10 a.m. (local time). By 7 p.m. that evening she signalled that she was over Archangel. She was fighting against a strong head wind. On the 28th she met the ice-breaker *Malygin* and alighted on the water beside her for 15 minutes to exchange mails, etc. General Nobile was on board the icebreaker. The airship then flew on and reached Franz Joseph Land by midnight.

Col. Lindbergh's Flight

COL. AND MRS. LINDBERGH left New York on July 27, in a Lockheed monoplane, for Japan, via Canada, Alaska, Siberia and China.

An Australia—England Attempt

MR. J. A. MOLLISON, an Australian airman, left Sydney for Wyndham, Western Australia, on July 25, on an attempt to break Mr. C. W. A. Scott's record of 10 days 23 hrs. for a flight from Australia to England. Mr. Mollison made an unsuccessful attempt last month when, it may be remembered, his machine crashed when he was taking off for Batavia.



AN AVRO "AVIAN" FOR SURVEY WORK IN TANGANYIKA: Note the air filter fitted to the air intake to prevent dust and sand from entering the air intake. The Vickers-Potts oil cooler will also be noticed.

THE ROYAL AIR FORCE

London Gazette, July 21, 1931.

General Duties Branch

Group Captain W. C. Hicks, A.F.C., is appointed Director of Airship Development, Air Ministry (July 1). D. M. Lynch-Staunton is granted a permanent commn. as Pilot Officer, with effect from July 11, 1931, and with seniority of July 11, 1930. The undermentioned Pilot Officers are promoted to rank of Flying Officer:—G. E. W. Parish (March 27); W. N. McKechnie (June 14); R. C. Parker (June 18); W. B. Bailey, J. Bamber, C. W. W. S. Conway, G. J. Holland, R. A. McMurtrie, W. T. Ratcliffe, B. P. Reynolds (June 27). Lt. A. Brock, R.N., is reattached to R.A.F. as Flying Officer with effect from July 7, 1931, and with seniority of Aug. 10, 1925.

Lt.-Cdr. H. L. St. J. Fancourt, R.N., Flight-Lt., R.A.F., ceases to be attached to R.A.F. on return to Naval duty (July 13). Flight Lt. S. H. Woolf (Capt., R.A.R.O.) resigns his short-service commn. (July 1). The undermentioned Flying Officers are transferred to Reserve (July 17):—Class A.—H. H. Ellison, L. S. Hill, C. C. D. Williams. Class C.—J. W. Pease.

The undermentioned relinquish their short-service commns., on account of ill-health (July 22):—Pilot Officer J. C. S. Proud, Pilot Officer on probation J. A. Andrews. The short-service commn. of the undermentioned Pilot Officers on probation are terminated on cessation of duty:—H. F. Clayton-Daubeny (July 1), J. H. Lingard (July 22). Flight Lt. C. I. A. Jackson (Lt. R. Tank Corps) relinquishes his temp. commn. on return to Army duty (July 16).

Dental Branch

R. Scoggins, L.D.S., is granted a non-permanent commn. as Flying Officer with effect from and with seniority of (July 6).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

The undermentioned are granted commns. in Class AA (ii) as Pilot Officers on probation (July 6):—J. L. Barker, W. H. Curtis, R. L. Moss. The

undermentioned Pilot Officers on probation are confirmed in rank:—G. P. Moss (July 2); A. G. P. Way (July 2); E. A. Beale (July 7); P. T. Stephens (July 7); J. C. Ticehurst (July 7); G. F. Phipps (July 14); L. F. Malone (July 18). Flying Officer A. E. Hill is transferred from Class A to Class C (May 21). Flying Officer G. P. E. Howard is transferred from Class AA (ii) to Class C (June 3). Flying Officer M. F. Ogilvie-Forbes relinquishes his commn. on appointment to the Royal Canadian Air Force (April 1). The commns. of the undermentioned Pilot Officers on probation are terminated on cessation of duty:—R. Wynzar (June 27); T. H. Popley (July 4).

AUXILIARY AIR FORCE

General Duties Branch

No. 602 (CITY OF GLASGOW) (BOMBER) SQUADRON.—A. Rintoul to be Pilot Officer (June 26). Pilot Officer B. C. H. Ogilvie is promoted to rank of Flying Officer (June 11).

No. 603 (CITY OF EDINBURGH) (BOMBER) SQUADRON.—The undermentioned to be Pilot Officers (June 30):—Lord George Nigel Douglas-Hamilton, P. Gifford.

No. 605 (COUNTY OF WARWICK) (BOMBER) SQUADRON.—R. Rendle to be Pilot Officer (May 15); Pilot Officer E. S. Lambert is promoted to the rank of Flying Officer (July 13).

No. 608 (NORTH RIDING) (BOMBER) SQUADRON.—H. C. Newhouse to be Pilot Officer (July 5).

Chaplains Branch

No. 602 (CITY OF GLASGOW) (BOMBER) SQUADRON.—The Rev. L. A. Sutherland, M.A., to be Chaplain, with the relative rank of Squadron Leader (May 11).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commander R. M. Field, to R.A.F. Depot, Uxbridge; 30.5.31.

Squadron Leaders: R. Halley, D.F.C., A.F.C., to R.A.F. Depot, Uxbridge; 30.5.31. H. G. R. Malet, to No. 70 Sqn., Hinaidi, Iraq; 1.7.31. C. R. Steele, D.F.C., to H.Q., R.A.F., Transjordan and Palestine, Jerusalem; 26.6.31.

Flight Lieutenants: H. K. Goode, D.S.O., D.F.C., to No. 502 Sqn., Aldergrove, Northern Ireland; 9.7.31. E. Burton, to R.A.F. Depot, Uxbridge, 30.5.31; J. A. W. Binnie, to H.Q., Coastal Area; 30.5.31. O. E. Carter, to Central Flying School, Wittering; 7.7.31. H. W. Taylor, to Station H.Q., North Weald; 2.7.31. R. T. Taaffe, to No. 41 Sqn., Northolt; 7.7.31. J. Warburton, to No. 2 Sqn., Manston; 13.7.31. W. A. Harvey, to Station H.Q., Duxford; 8.7.31. B. B. Caswell, to No. 17 Sqn., Upavon; 13.7.31. H. P. G. Leigh, to No. 1 Sch. of Tech. Training (Apprentices), Halton; 11.7.31. A. C. B. Harrison, M.C., to Station H.Q., Kenley; 7.7.31. J. G. Hawtrey, to No. 43 Sqn., Tangmere; 15.7.31.

Flying Officers: P. K. Robertson, to Station H.Q., Heliopolis, Egypt; 24.6.31. H. G. Hamilton, to No. 58 Sqn., Worthy Down; 2.7.31. W. F. Murray, to No. 210 Sqn., Pembroke Dock, instead of to Marine Aircraft Experimental Estab., Felixstowe, as previously notified; 13.6.31. T. J. Rees, to R.A.F. Base, Gosport; 8.7.31. L. S. Cundell, L. O. Welch, both to No. 26 Sqn., Catterick; 23.6.31. J. S. Hindmarsh, to No. 16 Sqn., Old Sarum; 23.6.31. J. R. Mutch, to Central Flying School, Wittering; 10.6.31. R. A. Davies, to No. 503 Sqn., Lincoln; 7.7.31.

Pilot Officers: N. E. Morrison, to No. 13 Sqn., Netheravon; 6.7.31. G. J. S. Chatterton, to No. 1 Sqn., Tangmere; 23.6.31. A. R. Collins, to No. 3 Sqn., Upavon; 23.6.31. M. R. D. Trewby, to No. 7 Sqn., Worthy Down; 23.6.31. R. B. Brown, to No. 9 Sqn., Boscombe Down; 23.6.31. A. J. McDougall, to No. 10 Sqn., Boscombe Down; 23.6.31. R. G. Harman,

to No. 25 Sqn., Hawkinge; 23.6.31. G. N. Snarey, to No. 32 Sqn., Kenley; 23.6.31. M. V. M. Clube, to No. 40 Sqn., Upper Heyford; 23.6.31. N. C. M. Styche, to No. 40 Sqn., Upper Heyford; 23.6.31. H. W. Mermagen, to No. 43 Sqn., Tangmere; 23.6.31. W. E. Hooper, to No. 99 Sqn., Upper Heyford; 23.6.31. J. B. S. Monypenny, to No. 58 Sqn., Worthy Down; 23.6.31. J. W. Bateman, to No. 207 Sqn., Bircham Newton; 23.6.31. E. J. Gracie, to No. 207 Sqn., Bircham Newton; 23.6.31. G. W. P. Grant, to No. 3 Flying Training School, Grantham; 6.7.31. D. G. Morris, to R.A.F. Depot, Uxbridge; 30.6.31. J. W. A. Hunnard, to No. 2 Flying Training School, Digby; 11.7.31.

Stores Branch

Flight Lieutenant W. G. MacD. Nicholl, to No. 203 Sqn., Basrah, Iraq; 18.6.31.

Medical Branch

Squadron Leaders: A. J. O. Wigmore, to H.Q., Wessex Bombing Area Andover; 14.7.31. P. T. Rutherford, O.B.E., to H.Q., Inland Area, Stanmore; 27.7.31.

Flight Lieutenant A. Dickson, to No. 10 Group H.Q., Lee-on-Solent; 18.7.31.

Flying Officer R. N. Kinnison, to Station H.Q., Netheravon; 13.7.31.

Dental Branch

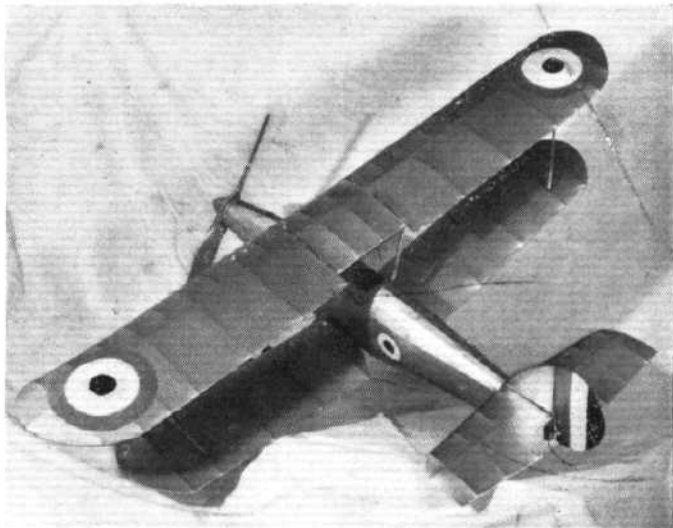
Flying Officers: R. Scoggins, to Medical Training Depot, Halton, on appointment to a non-permanent commn.; 6.7.31. J. G. Stewart, to R.A.F. Depot, Uxbridge; 16.7.31.

NAVAL APPOINTMENT.

The following appointment has been made by the Admiralty:—LIEUT. (Flying Officer, R.A.F.).—L. E. RICKETTS, to R.A.F. Base, Gosport; July 2.



This model, constructed by H. W. Austin, T.M.A.C., was based on the Hawker "Hart" Day Bomber, and follows its design in general appearance. A dihedral angle was given to the top plane for stability. Details: Span, 46 in.; Length, 34 in.; Weight, 24 oz.; Wing loading, 6½ oz./sq. ft.; Performance, 150 yards hand launched, 100 yards, R.O.G. (FLIGHT Photos.)



AIRCRAFT COMPANIES' STOCKS AND SHARES

DURING the whole of July the stock and share markets remained under the influence of developments in the international financial situation, but in many cases quotations are higher on balance for the month. A fair amount of business has passed in the shares of aircraft and associated companies, and prices have moved in favour of holders. Imperial Airways responded to the general tendency with a satisfactory recovery from the low price touched in June; market men are not inclined to forecast the results for the past year. Petters ordinary and preference have come in for more attention. In each case there has been an improvement in price on balance, despite the recession in profits from £40,917 to £35,334, and the "cut" of 1 per cent. in the dividend to 6 per cent. The market was favourably impressed by the results in view of the conditions ruling, and, notwithstanding the cautious tone of the chairman's address regarding the current year's prospects, the shares maintained their improvement. The company is shortly making important additions to its range of engine manufactures, from which increased business is anticipated when trade improves. Both Rolls-Royce and Fairey Aviation have been firm in response to the better market conditions; they may shortly come in for more attention in view of the forthcoming Schneider contest. A market slip points out that although Fairey Aviation's profits were £335,000 for the past two years, only £70,000 has been distributed in dividends. There has been an improvement in D. Napier & Son 5s. ordinary to 7s. 6d. Although the interim dividend is not due to be announced until October, it is already being discussed. It is suggested that if the rate be maintained, a good case could be made out for a higher price for the shares. For the past year there was a large margin of profits over the 15 per cent. dividend, 27 per cent. being actually earned on the ordinary capital. De Havilland were well

Name.	Class.	Nominal Amount of Share.	Last Annual Dividend.	Current Week's Quotation.
Anglo-American Oil ..	Deb.	Stk.	5½	102
Armstrong Siddeley Develop. ..	Cum. Pref.	£1	6½	14/4½xd
Birmingham Aluminium Castg.	Ord.	£1	7½	18/6
Booth (James), 1915 ..	Ord.	£1	15	38/6
Do. do. ..	Cum. Pref.	£1	7	22/-
British Aluminium ..	Ord.	£1	10	28/9
Do. do. ..	Cum. Pref.	£1	6	20/-
British Celanese ..	Ord.	10/-	Nil	5/3
British Oxygen ..	Ord.	£1	8½	16/3
Do. do. ..	Cum. Pref.	£1	6½	20/-
British Piston Ring ..	Ord.	£1	22½	28/9
British Thomson-Houston ..	Cum. Pref.	£1	7	22/9
Brown Brothers ..	Ord.	£1	10	21/3
Do. do. ..	Cum. Pref.	£1	7½	22/6
Dick (W. B.) ..	Cum. Pref.	£10	5	116/3xd
De Havilland Aircraft ..	Ord.	£1	5	18/-
Dunlop Rubber ..	Ord.	c	6	20/-
Do. do. ..	"C" Cum. Pref.	16/-	10	18/1½
En-Tout-Cas (Syston) ..	Def. Ord.	1/-	Nil	1/-
Do. do. ..	Ptg. Pfd. Ord.	5/-	8	3/9
Fairey Aviation ..	Ord.	10/-	7*	13/6
Do. do. ..	1st. Mt. Deb.	Stk.	8	107½
Firth (T) & John Brown ..	Cum. Pref.	£1	6D	9/-
Do. do. ..	Cum. Pref.	£1	5*	10/-
Ford Motor (England) ..	Ord.	£1	10	48/-
Fox (Samuel) ..	Mt. Ptual.	Stk.	5	71½
Goodyear Tyre & Rubber ..	Deb.	Stk.	6½	101
Handley Page ..	Ptg. Pref.	8/-	12½	10/9
Hoffmann Manufacturing ..	Ord.	£1	Nil	17/9
Do. do. ..	Cum. Pref.	£1	7½	15/7½
Imperial Airways ..	Ord.	£1	5	14/7½
Kayser, Ellison ..	Ord.	£5	6	50/-
Do. do. ..	Cum. Pref.	£5	6	73/9
Lucas (Joseph) ..	Ord.	£1	25	61/3
Napier (D.), & Son ..	Ord.	5/-	15	7/6
Do. do. ..	Cum. Pref.	£1	7½	25/-
Do. do. ..	Pref.	£1	8	22/6
National Flying Services ..	Ord.	2/-	Nil	-/6
Petters ..	Ord.	£1	6	21/3
Do. do. ..	Cum. Pref.	£1	7½	20/-
Roe (A. V.) (Cont. by Arm- strong Siddeley Devel., q.v.)	Ord.	£1	—	—
Rolls-Royce ..	Ord.	£1	10	35/-
Smith (S.) & Sons (M.A.) ..	Def. Ord.	1/-	18½	1/-
Do. do. ..	Ptg. Pfd. Ord.	£1	12½	12/6
Do. do. ..	Cum. Pref.	£1	7½	16/9
Serck Radiators ..	Ord.	£1	17½	30/6
"Shell" Transport & Trading ..	Ord.	£1	17½*	48/-
Do. do. ..	Cum. Pref.	£10	5	£10½
Triplex Safety Glass ..	Ord.	£1	5	27/-
Vickers ..	Ord.	6/8	8	6/9
Do. do. ..	Cum. Pref.	£1	5*	17/6
Vickers Aviation (Cont. by Vickers, q.v.)	—	—	—	—
Westland Aircraft (Branch of Petters, q.v.) ..	—	—	—	—
Whitehall Electric Investmts.	Cum. Pref.	£1	7½	25/9

* Dividend paid tax free.
c £1 unit of stock.

a Rate per annum for nine months.
b Last xd. on March 19.

maintained; the market was inclined to attach importance to the possibilities of the Moth aeroplane produced by the company for military training. Dunlop Rubber are higher on the month. National Flying Services remained at 6d.; the company's year closed on July 31 and the report is due to be submitted by October. Handley-Page participating preference hardened early in the month, but did not retain all the improvement. Triplex Glass have risen. Serck Radiators were lower at Birmingham on fears of a reduced distribution for the year to July 31. Birmingham Aluminium Castings' year closed on the same date; in each case the report is due to be submitted in October or November.

PUBLICATIONS RECEIVED

Royal Air Force Quarterly. July, 1931. Vol. 2, No. 3. Aldershot: Gale & Polden, Ltd. Price 5s. net.
Portrait of an Airman. By Philip Arnall. London: John Lane, The Bodley Head, Ltd. Price 7s. 6d. net.
Clouds Over Germany. Special Edition of No. 8 of "Passing Through Germany." Edited by Karl Kiesel. Terramare Office, Wilhelmstrasse 23, Berlin, S.W.48.
Wings Over the World. Edited by J. L. French. Milton Bradley Co., Springfield, Mass., U.S.A. Price \$1.00.
Barnard on Learning to Fly. By Capt. C. D. Barnard. London: Sampson Low, Marston Co., Ltd. Price 15s. net.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors
The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1930

Published July 23, 1931

- 6,042. A. SEIDEL. Air propeller with angle of pitch changeable in flight. (351,507.)
11,276. A. SWAN and W. HELMORE. Means for protecting i.c. engines for use on aircraft. (351,613.)
15,013. ETABLISSEMENTS AERA. Piloting apparatus operating with compressed-air gyroscopes. (351,672.)
16,353. T. ROSE. Dirigibles. (351,699.)
17,548. E. GARDNER and GARDNER and SONS, LTD. Valve mechanism of Diesel engines. (351,716.)
21,063. BRITISH THOMSON HOUSTON CO., LTD. Control systems for aeroplanes, etc. (351,758.)
28,412. M. BERGERON. Braking apparatus for aircraft. (351,836.)
28,854. W. FINCH. Cabinet adapted to be fitted in aircraft for use of passengers. (351,843.)
31,973. G. SERRAGLI. Self-rotating air screws for aerodynamic braking or retardation of aeroplanes. (351,869.)
35,485. SOC. INDUSTRIELLE D'AVIATION LATECOERE. Aeroplanes comprising a detachable part adapted to float, especially hydro-aeroplanes. (351,889.)
38,532. G. L. R. J. MESSIER. Landing device for high-speed aeroplanes. (351,896.)

APPLIED FOR IN 1930

Published July 30, 1931

- 19,798. AMERICAN PROPELLER CO. Variable-pitch airscrews. (352,239.)
19,931. R. A. A. COUZINET. Hydroplanes. (352,243.)
21,184. SOC. ANON. DES ATELIERS D'AVIATION L. BREGUET and L. BREGUET. Automatic pitch-adjusting device for variable-pitch propellers and rotating wings. (352,260.)
23,487. BOULTON and PAUL, LTD., and J. D. NORTH. Wings, etc., for aircraft. (352,286.)
23,488. BOULTON and PAUL, LTD., and J. D. NORTH. Aircraft wings. (352,287.)
26,876. R. A. A. COUZINET. Collapsible undercarriages for alighting on land and water. (352,313.)

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